

JVC

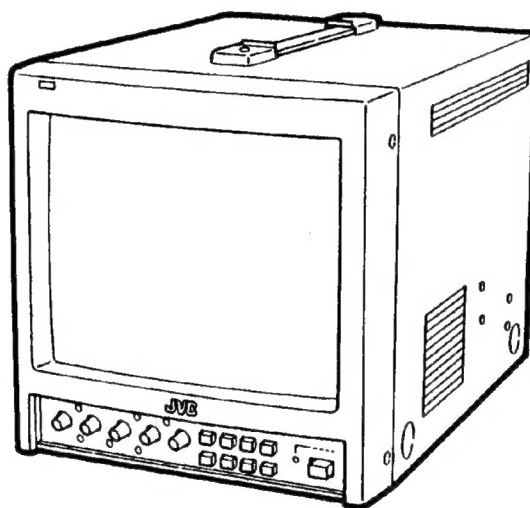
SERVICE MANUAL

COLOR VIDEO MONITOR

TM-910SU

BASIC CHASSIS

B10



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SPECIFICATIONS

Item	Content
Color system Picture tube Screen size (W × H)	NTSC / PAL 9" diagonally measured, 90° deflection, in-line gun. Vertical stripe phosphor pitch 0.5 mm 6-7/8" × 5-3/8" (175 × 137mm) 8-3/4" (222mm) Diagonal
High Voltage Audio Output Speaker (Built-in)	22kV ± 1kV (at zero beam current) 1W (monaural) 3-3/16" (8cm) Round Type, 8Ω
Scanning freq. Hori. resolution	(H) : 15.734kHz (NTSC) / 15.625kHz (PAL) (V) : 59.94Hz (NTSC) / 50Hz (PAL) 280 TV line or more
Video Input A	1Vp-p, 75Ω, negative sync, termination switch provided. Bridged connection is possible. (BNC connector × 2)
Video Input B	1Vp-p, 75Ω, negative sync. (BNC connector × 2) Y : 1.0Vp-p, 75Ω C : 0.286Vp-p, 75Ω (NTSC) 0.3Vp-p, 75Ω (PAL) (mini-DIN 4-pin connector × 2) Termination switch provided. Bridged connection is possible. * Y/C priority when both connected.
Audio Input A	500mVrms, high impedance, Bridged connection is possible. (RCA pin jack × 2)
Audio Input B	500mVrms, high impedance. Bridged connection is possible. (RCA pin jack × 2)
External sync Tally / Remote	1~4Vp-p, 75Ω (BNC connector × 2) Termination switch provided. Bridged connection is possible. DIN 8-pin × 1
Environmental conditions Operation temperature Operation humidity	0~40°C (32~104°F) 20~80% (non-condensing)
Power requirements Power consumption	120V AC, 50/60Hz or 12V DC 0.57A (120V AC), 3.3A (12V DC)
Dimension (W × H × D)	8-3/4" × 9-3/8" × 12-1/2" (222mm × 236mm × 317mm)
Mass	16.3 lbs (7.4kg)

Design & specification subject to change without notice.

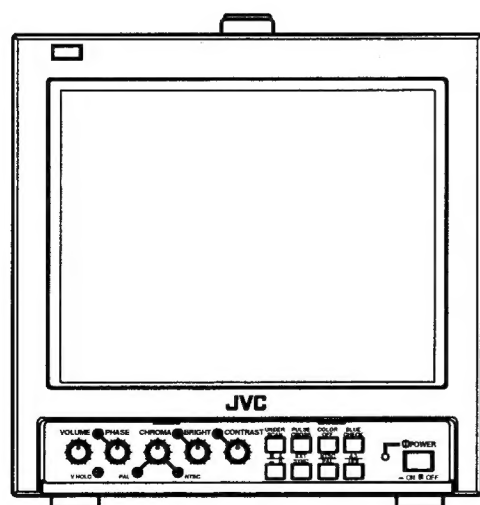
OPERATING INSTRUCTIONS

JVC®

COLOR VIDEO MONITOR

TM-910SU

INSTRUCTIONS



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For Customer Use:

Enter below the Serial No. which is located on the rear of the cabinet. Retain this information for future reference.

Model No. : TM-910SU
 Serial No. : _____

Thank you for purchasing this JVC color video monitor. To get the most from your new high-performance monitor, please read this manual carefully beforehand.

SAFETY PRECAUTIONS

WARNING:

TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION:

To reduce the risk of electric shock, do not remove cover.
Refer servicing to qualified service personnel.

FCC INFORMATION (U.S.A. only)

CAUTION: Changes or modifications not approved by JVC could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

PRECAUTIONS

- Use only the power source specified on the unit. (120 V AC, 50/60 Hz or 12 V DC)
- Keep flammable material, water, and metal objects away from the unit — especially the interior of the unit.
- This unit incorporates high voltage circuitry which. For your own safety and that of your equipment, do not attempt to modify or disassemble this monitor. There are no user-serviceable parts inside.
- Unplug the monitor when you're not going to be using it for a long period.

HANDLING

- Avoid shocks or vibrations. These may damage the unit and cause it to malfunction.
- Do not block the ventilation slots.
- Do not expose this unit to high temperatures. Extended exposure to direct sunlight or a heater could deform the cabinet or cause the performance of internal components to deteriorate.
- Do not place the unit near appliances generating strong electric or magnetic fields. These can generate picture noise and instability.
- Keep the monitor clean by wiping the cabinet and CRT screen with a piece of soft cloth. Do not apply thinner or benzene. These chemicals can damage the finish and erase printed letters. When the unit is excessively dirty, use a diluted neutral cleanser, then wipe away the cleanser with a dry cloth.

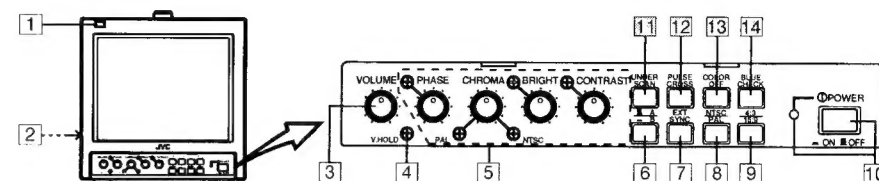
SCREEN BURN

- Try to avoid displaying still images or extremely bright images on the screen for an extended period of time. If left on screen for too long the image will be permanently etched onto the CRT — a phenomenon known as "screen burn". Screen burn is not a problem when displaying moving pictures during video playback.

CONTROLS AND FEATURES

Front

<Front Panel>



1 Tally lamp

Indicates that a control signal is being received. The tally lamp functions when the control signal is input to the TALLY/REMOTE terminal on the rear panel.

2 Speaker

A built-in speaker is located inside the left side panel.

3 VOLUME control

Adjusts the speaker volume.

4 V.HOLD control

Use a small-bladed screwdriver to adjust the image's vertical stability.

5 Picture control section

PHASE, CHROMA, BRIGHT and CONTRAST controls are available.

The standard setting mode can be obtained by setting each control to the center click position. To adjust a setting, insert a small-bladed screwdriver into the space around the knob and turn it to the desired position. When adjusting, use the small-bladed screwdriver and insert it into the control hole around the required control knob.

■ PHASE control

Adjusts picture hue.

■ CHROMA control

Adjusts picture color density.

■ BRIGHT control

Adjusts picture brightness.

■ CONTRAST control

Adjusts picture contrast.

Notes:

- * The PHASE control is effective only in the NTSC color system mode.
- * The standard CHROMA setting can be adjusted to suit the NTSC or PAL color system.

6 VIDEO A/B switch

Select the video signal input to the video input terminals on the rear panel.

A (■) : Selects the video signal input to VIDEO A terminal.

B (■) : Selects the video signal input to VIDEO B terminal.

Note:

* VIDEO B terminals include both Y/C (S-Video) and composite VIDEO terminals. Y/C inputs have priority.

7 EXT SYNC switch

Selects internal sync or external sync.

When using with the external sync, input the sync signal to the EXT SYNC terminal on the rear panel.

(■) : Internal sync

(■) : External sync

8 NTSC/PAL switch

Selects the NTSC or PAL color system.

NTSC (■) : For NTSC color system.

PAL (■) : For PAL color system.

9 4:3/16:9 switch

Selects the aspect ratio (4:3 or 16:9) of the picture displayed on the screen.

(■) : 4:3

(■) : 16:9

Note:

* When a 4:3 picture is viewed in the 16:9 mode, the size of the image is reduced vertically.

10 POWER switch/POWER indicator

Press this switch to turn the power on or off.

ON (■) : Power is turned on and the power indicator lights.

OFF (■) : Power is turned off and the power indicator goes off.

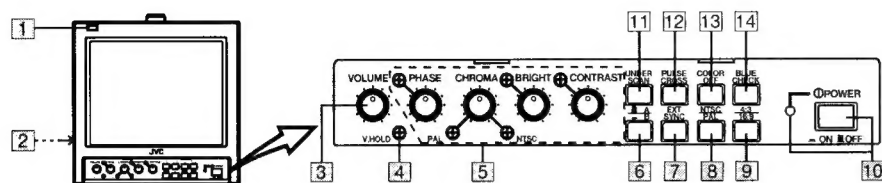
Note:

* If the battery expires while the monitor is operated with DC power supply (the voltage level drops), the green indicator changes to orange, then to red. When the POWER indicator changes to red, the power automatically goes off. Make sure you switch off the power before replacing the battery.

(continued on the next page →)

I CONTROLS AND FEATURES (cont'd)

<Front Panel>



11 UNDER SCAN switch

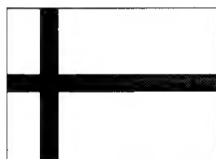
Selects the scanning mode (over scan screen or under scan screen).

(■) : Over scan screen
(▲) : Under scan screen

12 PULSE CROSS switch

Checks the retrace period (sync signal) by delaying the input signal.

(■) : Normal screen
(▲) : Retrace period display screen



13 COLOR OFF switch

Selects the screen mode (color or B/W). Useful when you want to check the white balance.

(■) : Color screen
(▲) : B/W screen

14 BLUE CHECK switch

Selects the screen mode (normal or monochrome blue screen). Useful when you want to check the chroma and phase adjustment.

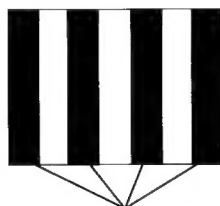
(■) : Normal screen
(▲) : Monochrome blue screen

Note:

* The PHASE adjustment is effective only in the NTSC color system mode.

[How to adjust]

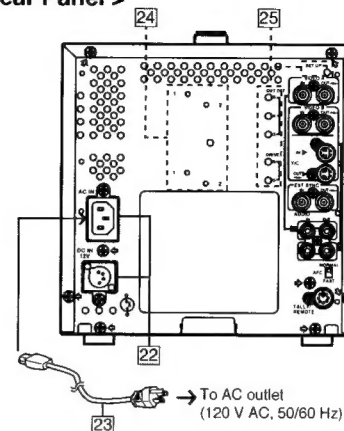
1. Select the monochrome blue screen mode and input color bar signals in the order of brightness.
2. Adjust the CHROMA and PHASE controls until the density and brightness of each blue bar are the same.



Adjust the blue bars to the same density and brightness.

Rear

< Rear Panel >



15 VIDEO A terminals

Video signal input (IN) and output (OUT) terminals. The output terminal is bridge-connected.

IN : Video signal input terminal

OUT : Bridge-connected video signal output terminal

Notes:

- * For corresponding audio signals, use the AUDIO A terminals [18].
- * Also refer to the Basic Connection Example on page 7.

16 VIDEO B terminals

Video signal input (IN) and output (OUT) terminals for both composite and Y/C-separated (S-Video) terminals. Each output terminal is bridge-connected.

[BNC terminals]

IN : Video signal input terminal

OUT : Bridge-connected video signal output terminal

[Y/C (mini-DIN 4-pin) terminals]

IN : Y/C-separated (S-Video) signal input terminal

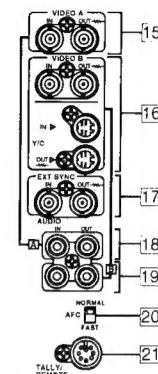
OUT : Bridge-connected Y/C signal output terminal

Notes:

- * For corresponding audio signals, use the AUDIO B terminals [19].
- * Y/C- terminal has priority.
- * Also refer to the Basic Connection Example on page 7.

■ Y/C terminal pin layout

Pin No.	Signal
1	GND (Y)
2	GND (C)
3	Y
4	C



17 EXT SYNC terminals

External sync signal input (IN) and output (OUT) terminals.

The output terminal is bridge-connected.

IN : Input terminal for the external sync signal

OUT : Bridge-connected output terminal

Note:

* Also refer to the Basic Connection Example on page 7.

18 AUDIO A terminals

Input (IN) and output (OUT) terminals for the audio signal corresponding to the VIDEO A terminals [15].

The output terminal is bridge-connected.

IN : Audio input terminal

OUT : Bridge-connected output terminal

Note:

* For corresponding video signals, use the VIDEO A terminals [15].

19 AUDIO B terminals

Input (IN) and output (OUT) terminals for the audio signal corresponding to the VIDEO B terminals [16].

The output terminal is bridge-connected.

IN : Audio input terminal

OUT : Bridge-connected output terminal

Note:

* For corresponding video signals, use the VIDEO B terminals [16].

20 AFC switch

Selects the AFC (Automatic Frequency Control) time constant for the horizontal sync circuit.

Correct the skewed portion of the picture.

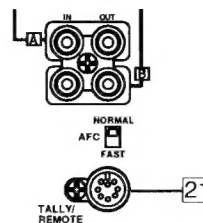
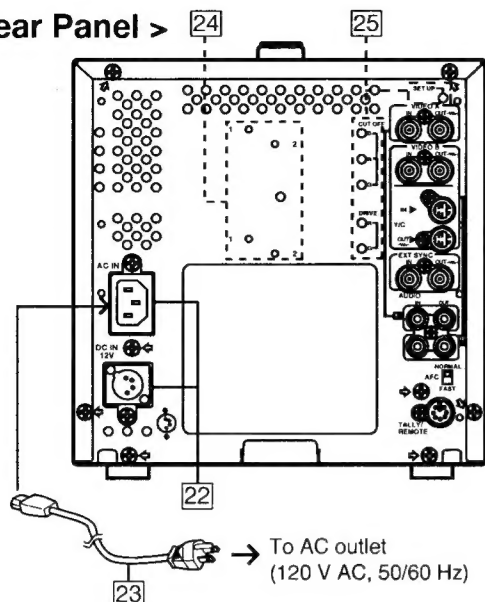
NORM position : Normal mode

FAST position : Fast mode (fast: smaller time constant)

(continued on the next page →)

CONTROLS AND FEATURES (cont'd)

< Rear Panel >



22 Power input connector

Supply power to either the AC IN or DC IN 12 V connector.

[AC IN]

Connect the provided AC power cord between the AC IN connector and an AC outlet (120 V AC, 50/60 Hz).

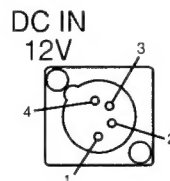
[DC IN 12 V]

Connect the 12 V DC power plug to the DC IN 12 V connector.

Notes:

- * See your dealer for more information on 12 V DC power supply.
- * When both AC IN and DC IN connectors are used, the AC input has priority.
- * The DC power supply does not automatically take over if an AC outlet is unplugged or the AC power is cut off when both AC and DC power supplies are connected. In this case, press the POWER switch to set to OFF, then press it again to turn the power ON.

■ DC IN 12 V connector pin layout



Pin No.	Signal
1	GND
2	—
3	—
4	12 V DC

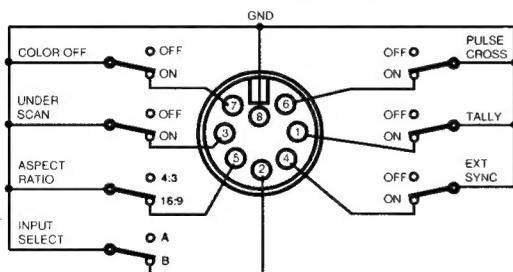
21 TALLY/REMOTE terminal

External control terminal (DIN 8-pin). Tally lamp, VIDEO A/B (input selection), Under Scan, External Sync, 4:3/16:9 (aspect ratio), Pulse Cross, and Color Off modes can be controlled from an external unit.

Note:

- * When you're controlling the monitor externally via the TALLY/REMOTE terminal, set all corresponding switches on the front panel to the OFF (■) position. (Whichever switch is pressed first has priority so remote switches may not function if the panel switches are ON (■) position.)

■ TALLY/REMOTE terminal pin layout



Pin No.	Signal
1	TALLY lamp ON/OFF
2	Input Select (VIDEO A/B) A/B
3	UNDER SCAN ON/OFF
4	EXT SYNC (External Sync) ON/OFF
5	ASPECT RATIO 4 : 3 / 16 : 9 (4 : 3 / 16 : 9)
6	PULSE CROSS ON/OFF
7	COLOR OFF ON/OFF
8	GND

23 Power cord

Connect the provided power cord to the AC IN connector.

24 External battery mounting holes

Attach an external battery to either pair of holes (1 or 2) to use 12 V DC power (depending on the type of battery).

Notes:

- * External batteries manufactured by Anton Bauer or PAG are available.
- * See your dealer for details.

25 Switch/control adjustment holes for service personnel

For adjustment of SET UP switch, CUT OFF (B, R, G) control and DRIVE (R, G) control during servicing.

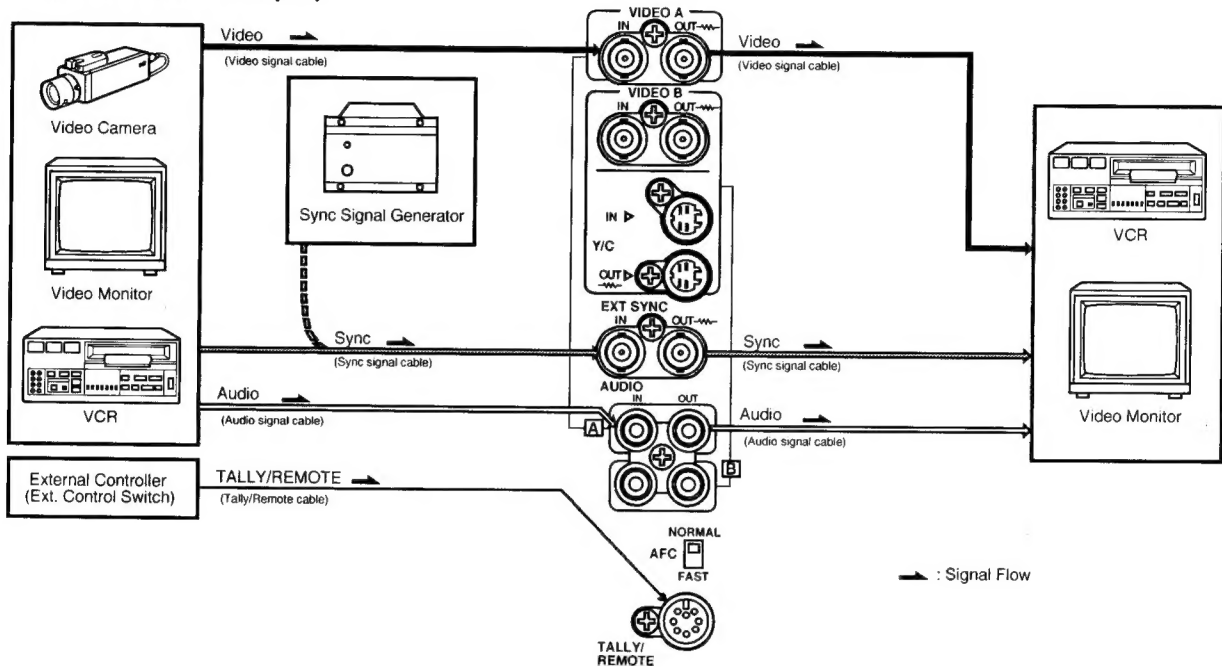
Note:

- * These controls are exclusively for the use of service personnel. Do not attempt to adjust them yourself.

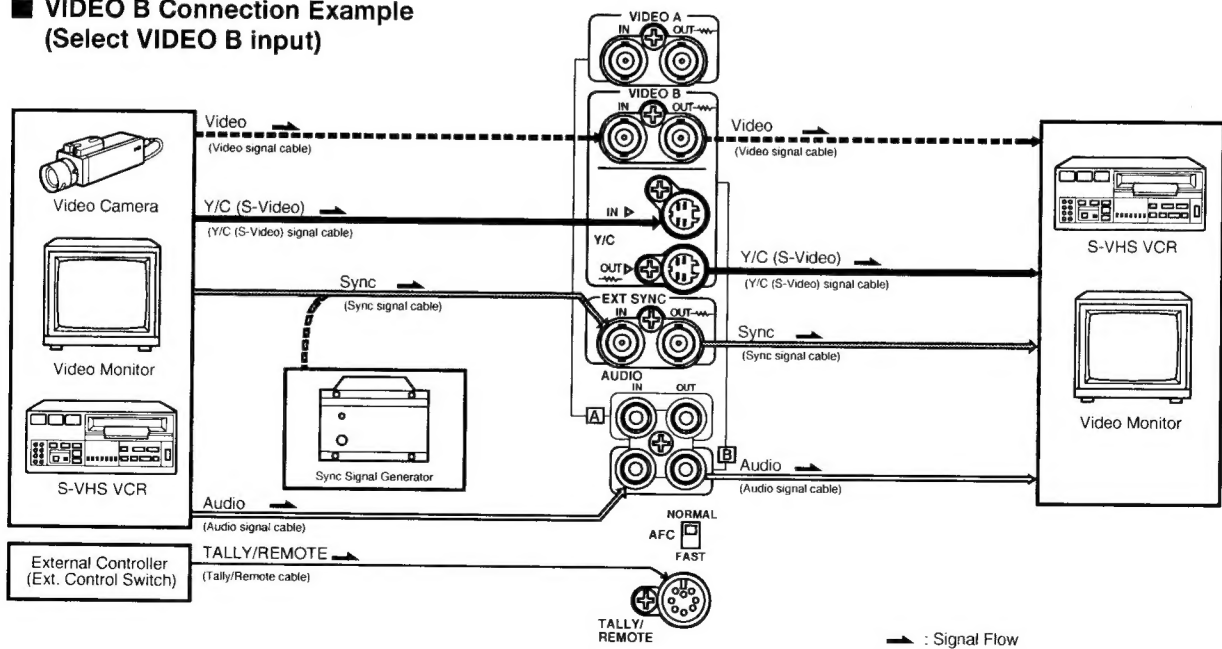
BASIC CONNECTION EXAMPLE

- * Before connecting your system, make sure that all units are turned off.
- * The illustration below shows some examples of different connections. Terminal connections may differ depending on the component connected. Be sure to refer to the instructions provided with the unit(s) you are connecting.
- * Each pair of input (IN) and output (OUT) terminals are bridge-connected. Do not connect input and output terminals inversely.
- * If you're not connecting any equipment to a bridged output (OUT) terminal, be sure not to connect any other cables to the bridged output (OUT) terminal as this will cause the terminating resistance switch to open (auto terminate function).
- * When making a bridge connection, connect the input (IN) and output (OUT) terminals on the monitor to separate video components.
(For example, if both terminals are connected to the same VCR, resonance may occur except during playback. This is caused by the same video signal "looping" between the VCRs, and is not a malfunction.)
- * Select the video input (VIDEO A or VIDEO B) with the VIDEO A/B switch on the front panel.

VIDEO A Connection Example (Select VIDEO A input)



VIDEO B Connection Example (Select VIDEO B input)



TROUBLESHOOTING

Solutions to common problems related to your monitor are described here. If none of the solutions presented here solves the problem, unplug the monitor and consult a JVC-authorized dealer or service center for assistance.

Problems	Points to be checked	Measures
No power supply.	Is the AC or DC power plug loosened or disconnected?	Firmly insert the power plug.
	Is the battery fully charged (when using DC power)?	Charge the battery, or replace it with a charged battery. (Refer to the instructions provided with the battery.)
No picture with the power on.	Is the video signal output from the connected component?	Set the connected component correctly.
	Is the input signal selected properly?	Select the required video signal input with the VIDEO A/B switch. (See page 3.)
	Is the video cable disconnected?	Connect the video signal cable firmly. (See page 7.)
No sound.	Is the audio signal output from the connected component?	Set the connected component correctly.
	Is the volume output set at the minimum position?	Adjust the VOLUME control. (See page 3.)
	Is the audio cable disconnected?	Connect the audio signal cable firmly. (See page 7.)
Shaking picture.	Is the monitor close to a device generating a strong magnetic field (motor, transformer, etc.)?	Move the device away from the monitor until the picture stabilizes.
No color, wrong color, or dark picture.	Is the color system selected properly?	Set the color system correctly with the NTSC/PAL switch. (See page 3.)
	Is the COLOR OFF switch set properly?	Set the COLOR OFF switch to the OFF (■) position. (See page 4.)
	Has the picture control setting (CONTRAST, BRIGHT, CHROMA or PHASE) been changed?	Set each picture control to the standard setting (center) position. (See page 3.)
Unnatural, irregularly colored, or distorted picture.	Is the monitor close to a speaker, magnet or any other device generating a strong magnetic field?	Move the device away from the monitor and turn the monitor's power off. Wait at least 30 minutes, then turn the power on again.
Dark stripes at the top and bottom of the screen, picture vertically squeezed.	Is the aspect ratio set to 16:9 (■)?	Press the 4:3/16:9 switch to restore the normal 4:3 mode (■). (See page 3.)
Picture flows.	Is the EXT SYNC switch set properly?	Set the EXT SYNC switch properly. (See page 3.)
Front panel switches do not function.	Is the monitor being controlled by an external control unit via the TALLY/REMOTE terminal?	Set the control on the external unit of the same function as that on the monitor's front panel to the OFF (■) position, or disconnect the unit from the TALLY/REMOTE terminal. (See page 6 and 7.)
External control not possible with the unit connected to TALLY/REMOTE terminal.	Is the switch on the front panel of the same function as that on the external control unit to the ON (■) position?	Set the control on the front panel of the same function as that on the external control unit to the OFF (■) position. (See pages 3, 4, 6 and 7.)

The following are not malfunctions:

- When a bright still image (such as a white cloth) is displayed for a long period, it may appear to be colored. This is due to the structure of the cathode ray tube and will be deleted when another image is displayed.
- You experience a mild electric shock when you touch the picture tube. This phenomenon is due to a normal buildup of static electricity on the CRT and is not harmful.
- The monitor emits a strange sound when the room temperature changes suddenly. This is only a problem if an abnormality appears on the screen as well.

I SPECIFICATIONS

■ Type	: Color video monitor	■ External sync	: Composite sync 1 line, BNC connector x 2 1 – 4 Vp-p, 75 Ω (bridge connection possible, auto termination)
■ Color system	: NTSC, PAL	■ Tally/Remote	: 1 line, DIN 8-pin x 1
■ Picture tube	: 9" measured diagonally, flat-square type, 90° deflection, in-line gun, vertical line trio type (phosphor stripe pitch 0.5 mm)	■ Audio power output	: 1 W (monaural)
■ Effective screen size	: Width 6-7/8" (175 mm) Height 5-3/8" (137 mm) Diagonal 8-3/4" (222 mm)	■ Built-in speaker	: 3-3/16" (8 cm) round x 1 impedance of 8 Ω
■ Scanning frequency	: (H) 15.734 kHz (NTSC) 15.625 kHz (PAL) (V) 59.94 Hz (NTSC) 50 Hz (PAL)	■ Environmental conditions	: Operation temperature: 0 – 40 °C (32 – 104 °F) Operation humidity: 20 – 80% (non-condensing)
■ Horizontal resolution	: 280 TV lines or more (Y/C input mode)	■ Power requirements	: 120 V AC, 50/60 Hz or 12 V DC
■ Input terminals		■ Power consumption	: 0.57A (120 V AC) 3.3A (12 V DC)
VIDEO A	: Composite video: 1 line, BNC connector x 2, 1 Vp-p, 75 Ω, negative sync (bridge connection possible, auto termination)	■ Dimensions	: Width 8-3/4" (222 mm) Height 9-3/8" (236 mm) Depth 12-1/2" (317 mm)
VIDEO B	: Composite video: 1 line, BNC connector x 2, 1 Vp-p, 75 Ω negative sync (bridge connection possible, auto termination) Y/C-separated: 1 line, mini-DIN 4-pin connector x 2 Y: 1.0 Vp-p, 75 Ω C: 0.286 Vp-p, 75 Ω (NTSC) 0.3 Vp-p, 75 Ω (PAL) (bridge connection possible, auto termination) * Y/C priority when both connected	■ Weight	: Approx. 16.3 lbs (approx. 7.4 kg)
AUDIO A	: 1 line (monaural), RCA pin x 2 0.5 V rms, high-impedance (bridge connection possible)	■ Accessory	: AC power cord [approx. 7.9 ft (approx. 2.4 m)] x 1
AUDIO B	: 1 line (monaural), RCA pin x 2 0.5 Vrms, high-impedance (bridge connection possible)		

* Illustrations used in this manual are for explanatory purposes only. The appearance of the actual product may differ slightly.

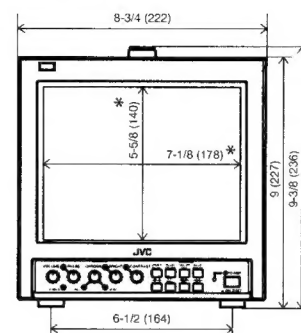
* E. & O. E. Design and specifications subject to change without notice.

TM-910SU COLOR VIDEO MONITOR

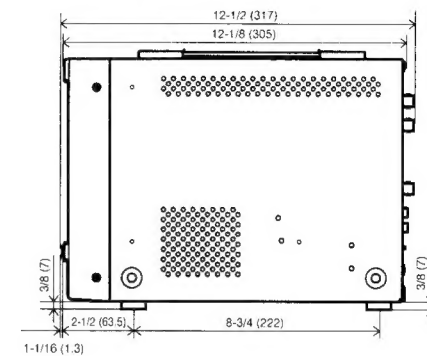
■ Dimensions

Unit : inch (mm)

< Front View >



< Side View >



* Asterisks (*) are used to indicate front panel dimensions.

JVC®

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Printed in Japan
CQ40283-A01
1096-K-Tu-U-Ni

SAFETY PRECAUTIONS

- The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
- Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
- Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (Δ) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.
- Use isolation transformer when hot chassis.**
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.
- Don't short between the LIVE side ground and ISOLATED(NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (⊥) side GND, the ISOLATED(NEUTRAL) : (⏏) side GND and EARTH : (⊕) side GND. Don't short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND and never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND at the same time.
If above note will not be kept, a fuse or any parts will be broken.
- If any repair has been made to the chassis, it is recommended that the B₁ setting should be checked or adjusted (See ADJUSTMENT OF B₁ POWER SUPPLY).
- The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
- Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10kΩ 2W resistor to the anode button.
- When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

10. Isolation Check

(Safety for Electrical Shock Hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1100V AC (r.m.s.) for a period of one second.

(... Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)

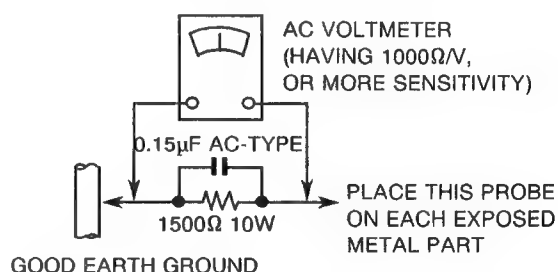
This method of test requires a test equipment not generally found in the service trade.

(2) Leakage Current Check

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

• Alternate Check Method

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner. Connect a 1500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.35V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).

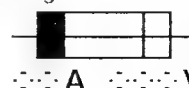


11. High voltage hold down circuit check.

After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.

See item "How to check the high voltage hold down circuit".

This mark shows a fast operating fuse, the letters indicated below show the rating.



SPECIFIC SERVICE INSTRUCTIONS

DISASSEMBLY PROCEDURE

[CAUTION]

- * Even with the power switch off, some parts of the set are live. Be sure to disconnect the power cord from the AC outlet before disassembly and reassembly.

REMOVING THE TOP COVER

1. Take out 4 screws (A) and 4 screws (B).
2. Slightly spread the bottom of the top cover. Shift the cover rearward and raise it upward to remove it.

REMOVING THE REAR PANEL

- Remove the top cover.
- 1. Take out 4 screws (C).
- 2. Shift the top portion of the rear panel slightly rearward and raise it upward to remove it.

REMOVING THE GUARD SHEET

- Remove the top cover and rear panel.
- 1. Pull out the rivet.
- 2. Shift the guard sheet upward to remove it.

REMOVING THE BOTTOM COVER

- After removing the top cover, rear panel and terminal bracket, follow the steps given below.
- 1. Place the front surface downward, then stand the bottom cover while facing it toward you.
At this time, care must be exercised not to damage the front panel and CRT surface.
- 2. Take out 1 screw (J), loosen the 2 screws marked (G) as shown in the figure.
- 3. After pulling the rear panel side of the bottom cover toward you slightly, keep the chassis base from the bottom cover slightly.
- 4. When the chassis base has been kept from the bottom cover slightly, pull the bottom cover upward while leaving the situation as it is, then remove the bottom cover.
- 5. When the bottom cover has been removed, you can check the main PWB and control PWB in such a situation.

REMOVING THE TERMINAL BRACKET

- Remove the top cover and rear panel.
- 1. Take out 2 screws (D), 7 screws (E) and 1 screw (F).
- 2. Slightly shift the terminal bracket rearward and raise it upward to remove it.

REMOVING THE CHASSIS BASE WITH THE CHASSIS

- Remove the top cover.
- Remove the rear panel.
- 1. Remove the claws located at the left and right sides of the bottom of the front panel toward outside.
- 2. While pulling the chassis base with the chassis rearward, remove it.

REMOVING THE POWER SW

- Remove the top cover.
- Remove the rear panel.
- Remove the chassis base even with the power switch off.
- 1. Take out the screw (H).
- 2. Remove the POWER SW sheet.
- 3. Press the claws (Y) and (Z) to detach the POWER SW 2 PWB. Then slightly raise the POWER SW 2 PWB.
- 4. The POWER SW 1 PWB can be removed by raising it after pressing the claws (X). (see Fig. 1)

REMOVING CONTROL PWB

- Remove the top cover.
- Remove the rear panel.
- Remove the chassis base.
- 1. The CONTROL PWB can be removed by simply raising it.

REMOVING THE CRT

- Remove the top cover.
- Remove the rear panel.
- Remove the chassis base.
- 1. Take out 4 screws (K).
- 2. Remove the CRT from the front panel.

REMOVING THE SPEAKER

- Remove the top cover.
- Remove the rear panel.
- Remove the terminal bracket.
- 1. Remove the speaker code from the speaker.
- 2. Remove the signal PWB.
- 3. Disengage the claw under the speaker.
- 4. Pull up the speaker.

[CAUTION]

- * When erecting the chassis, be careful so that there will be no contacting with other PW board.
- * Before turning on power, make sure that the wire connector, CRT earth wire and other connectors properly connected.

WIRE CLAMPING AND CABLE TYING

1. Be sure to clamp the wire.
2. Never remove the cable tie used for tying the wires together. Should it be inadvertently removed, be sure to tie the wires with a new cable tie.

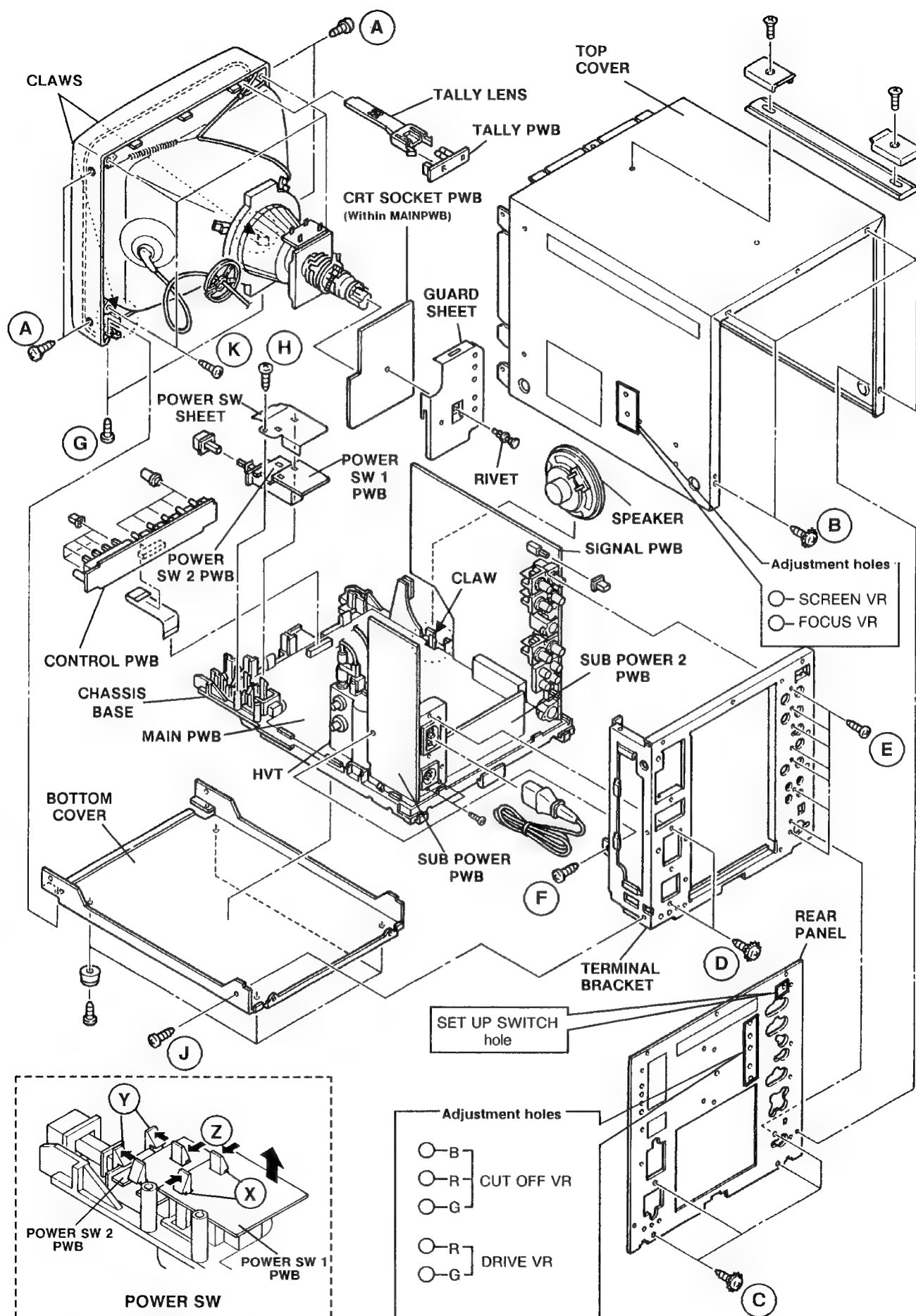


Fig.1

REPLACEMENT OF CHIP COMPONENT

CAUTIONS

1. Avoid heating for more than 3 seconds.
2. Do not rub the electrodes and the resist parts of the pattern.
3. When removing a chip part, melt the solder adequately.
4. Do not reuse a chip part after removing it.

SOLDERING IRON

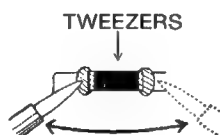
1. Use a high insulation soldering iron with a thin pointed end of it.
2. A 30w soldering iron is recommended for easily removing parts.

REPLACEMENT STEPS

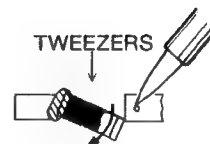
1. How to remove Chip parts

- Resistors, capacitors, etc

- (1) As shown in the figure, push the part with tweezers and alternately melt the solder at each end.

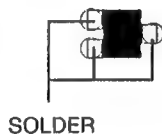


- (2) Shift with tweezers and remove the chip part.

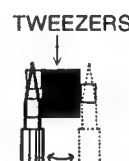


- Transistors, diodes, variable resistors, etc

- (1) Apply extra solder to each lead.



- (2) As shown in the figure, push the part with tweezers and alternately melt the solder at each lead. Shift and remove the chip part.

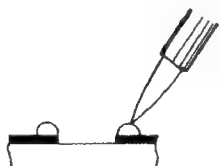


Note: After removing the part, remove remaining solder from the pattern.

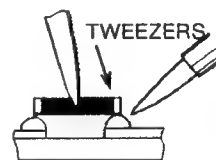
2. How to install Chip parts

- Resistors, capacitors, etc

- (1) Apply solder to the pattern as indicated in the figure.



- (2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.



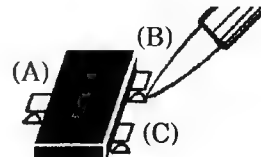
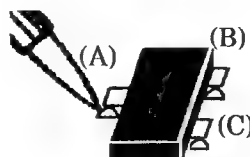
- Transistors, diodes, variable resistors, etc

- (1) Apply solder to the pattern as indicated in the figure.

- (2) Grasp the chip part with tweezers and place it on the solder.

- (3) First solder lead A as indicated in the figure.

- (4) Then solder leads B and C.



SERVICE ADJUSTMENTS

PRIOR TO STARTING ADJUSTMENT

1. Supply power to the set and measuring instruments and allow to warm up for at least 30 minutes.
2. Confirm the proper AC power voltage is being supplied.
3. Use care not to disturb controls and switches not mentioned in the adjustment items.
4. Refer to adjustment settings and set user operated controls (bright, contrast, chroma, etc.) to the indicated positions.

TOOLS AND FIXTURES FOR ADJUSTMENT

- DC voltmeter (digital voltmeter)
- Oscilloscope
- Signal generator (PAL / NTSC systems)
 - Color bar and split color bar patterns
 - Crosshatch pattern
 - Cross pattern
 - Red raster pattern
 - Green raster pattern
 - Blue raster pattern
 - Phillips pattern (including R-Y and B-Y)
 - TV resolution pattern
- Color analyzer

ADJUSTMENT SETTINGS

1. Front controls		3. Rear SW	
CONTRAST	Center click position	AFC	NORMAL
BRIGHT	Center click position	SET UP	OFF
CHROMA	Center click position		
PHASE	Center click position		
VOLUME	Center		
2. Front SW			
UNDER SCAN	OFF		
PULSE CROSS	OFF		
COLOR OFF	OFF		
BLUE CHECK	OFF		
INPUT A/B	A		
EXIT SYNC	OFF		
NTSC / PAL	NTSC		
4:3 / 16:9	4:3		

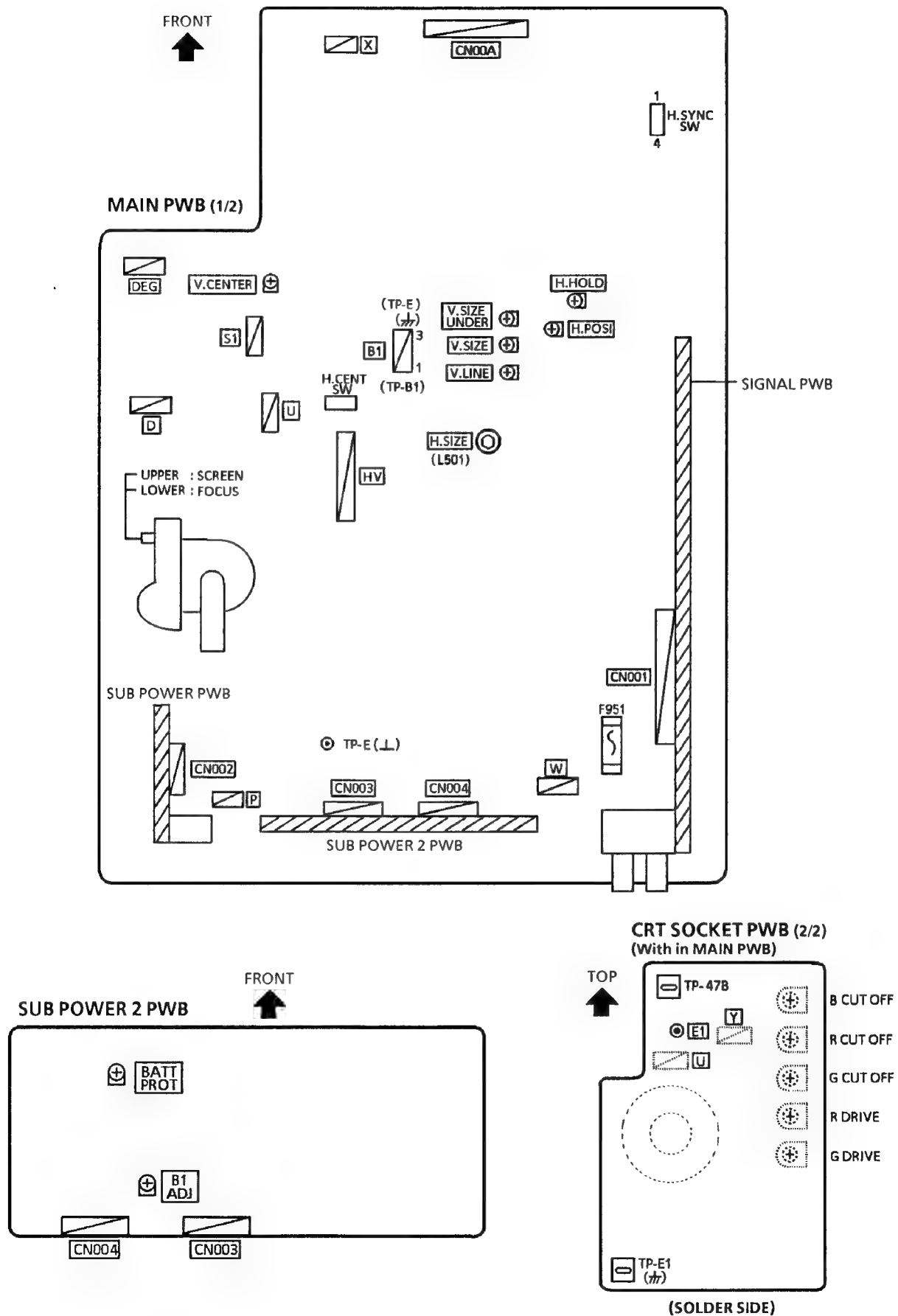
FOCUS, SCREEN, CUT OFF AND DRIVE, SET UP SWITCH ADJUSTMENT HOLES

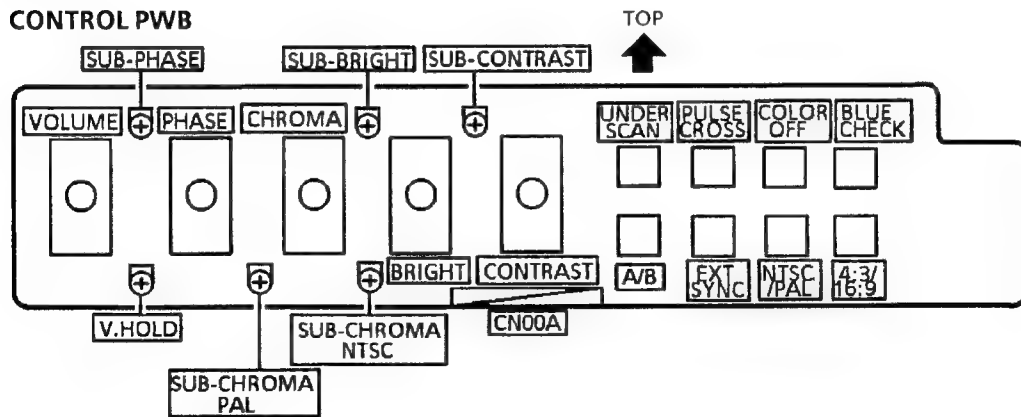
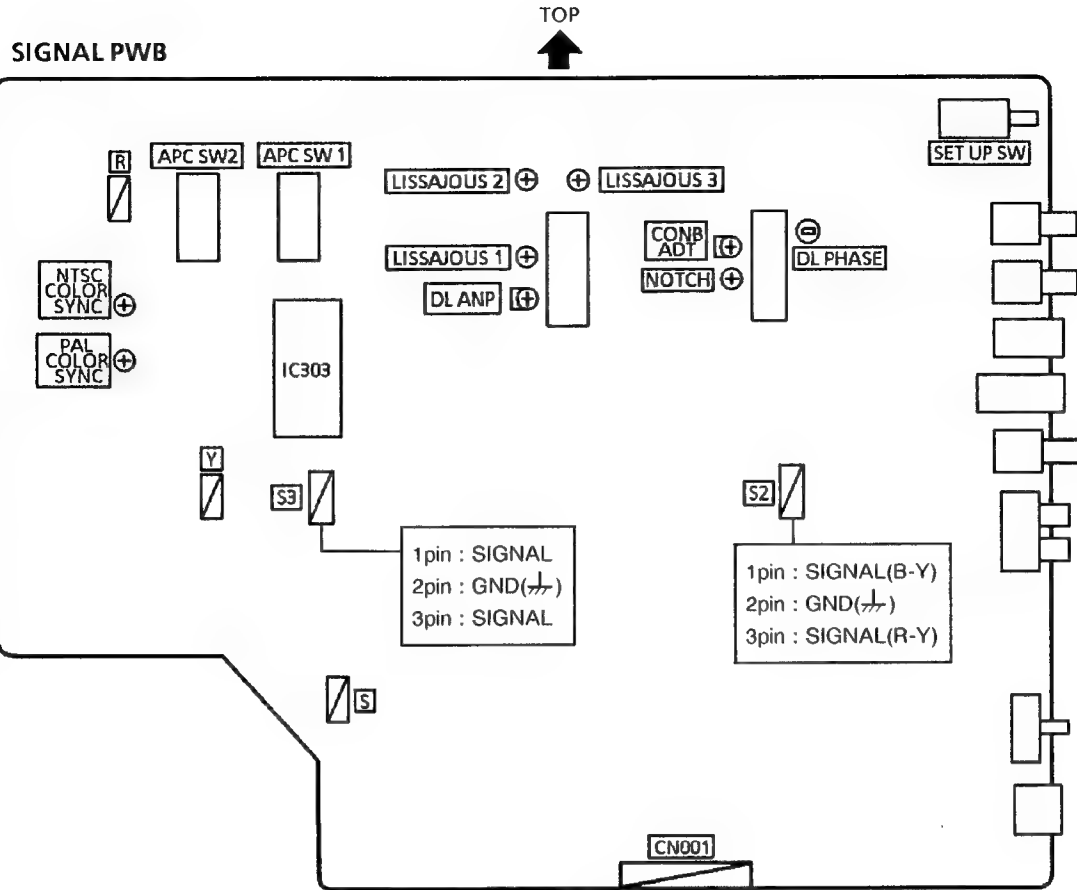
- The Focus and Screen adjustment holes are on the side of the set (see Page 5).
- The SET UP SWITCH hole is on the rear panel of the set (see page 5).
- The Cut off and Drive adjustment holes are on the rear panel of the set (see Page 5).

[CAUTION]

Be sure to use a non-metallic screwdriver for adjusting there VRs. A metallic driver can cause damage by shorting.

ADJUSTMENT LOCATIONS

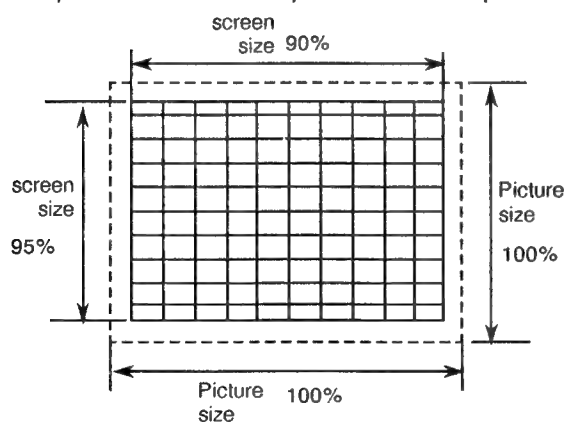




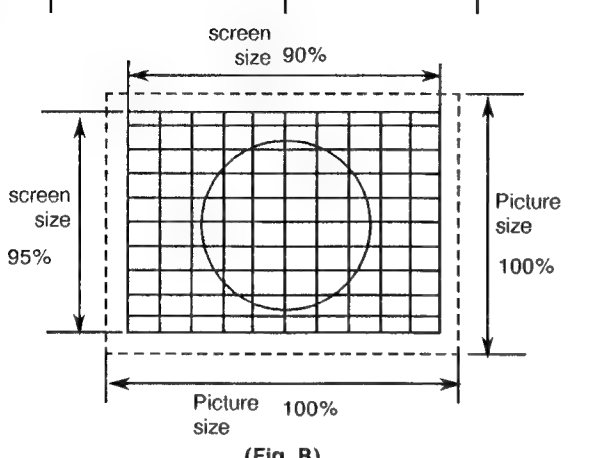
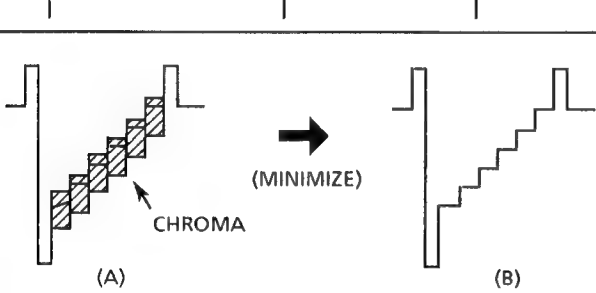
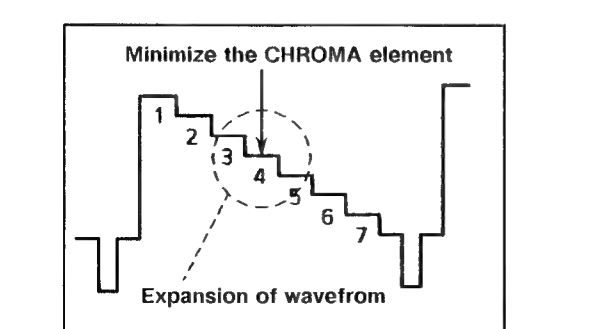
ADJUSTING STEP

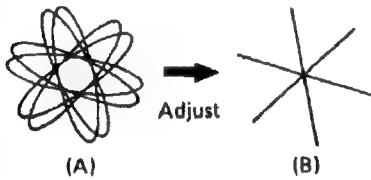
Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
B1 voltage check (AC)	DC Voltmeter Signal generator	TP-B1(1 pin) TP-E(⚡)(3 pin) [B1 connector in MAIN PWB]		<ul style="list-style-type: none"> Make sure that input power is 120V AC, 60Hz. <ol style="list-style-type: none"> Input an all-black signal. Confirm DC $114.8V \begin{smallmatrix} +1.0V \\ -1.3V \end{smallmatrix}$ between TP-B1 and TP-E(⚡).
B1 voltage check (DC)	DC Voltmeter Signal generator	TP-B1 (1 pin) TP-E(⚡)(3 pin) [B1 connector in MAIN PWB]	B1 ADJ VR [SUB POWER 2 PWB]	<ul style="list-style-type: none"> Make sure that input power is $13V \pm 0.1V$ DC. <ol style="list-style-type: none"> Input an all-black signal. Connect DC voltmeter TP-B1 and TP-E(⚡). Turn the B1 ADJ VR from rearward and bring B1 voltage to DC $114.8V \pm 0.1V$. Make sure that the B1 voltage is DC $114.8V \begin{smallmatrix} +1.0V \\ -1.3V \end{smallmatrix}$ when the DC power supply voltage has been changed in the range of $10.4V \sim 18.0V$. <ul style="list-style-type: none"> Don't use metal screw driver.
DC Shut off voltage adjustment	DC Voltmeter Signal generator		BATT.PROT VR [SUB POWER 2 PWB]	<ul style="list-style-type: none"> Turn the BATT.PROT VR fully clock wise from rearward in advance. Make sure that input power is $12V \pm 0.1V$ DC. <ol style="list-style-type: none"> Input an all-black signal. Connect digital voltmeter to DC terminal. Adjust DC power supply voltage bring to DC $10.3 \pm 0.01V$ (digital volt mete measured). Slightly turn the BATT.PROT VR counter-clock wise until power shut off. (POWER RED lights) Turn on the power again and make sure that the POWER LED indicates a green color when the input power is 12V. <p>※ When regaining the power supply, slightly increase the output voltage of the DC power supply, then turn the main switch of the TV set OFF before turning it ON again.</p>
Focus adjustment	Signal generator		FOCUS VR [HVT]	<ol style="list-style-type: none"> Input a crosshatch signal. Turn the FOCUS VR to the range of best focus of the crosshatch signal.
H.HOLD adjustment	Signal generator		H.SYNC SW H.HOLD VR [MAIN PWB]	<ol style="list-style-type: none"> Input a monoscope pattern signal. Turn H.SYNC SW to left (4) side. Adjust the H.HOLD VR so that the monoscope pattern turn to normal in the screen. Turn H.SYNC SW to right side. Make sure that the normal picture can be displayed on the CRT immediately when the input select A / B SW was changed. Repeat the steps 2~4 above, if necessary.

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
V.HOLD adjustment	Signal generator		V.HOLD VR [FRONT PANEL]	<ol style="list-style-type: none"> 1. Input a NTSC color bar signal. 2. Switch the NTSC / PAL SW on the front panel to the PAL side and the 4:3 / 16:9 SW on the front panel to the 16:9 side. (At this time, make sure that the color in the picture on the CRT has died away and the vertical amplitude has been diminished in size.) 3. Turn the V.HOLD VR on the front panel clockwise from its minimum position and stop it at the position where the vertical synchronization has been obtained. 4. Return the NTSC / PAL SW to the NTSC side and the 4:3 / 16:9 SW to the 4:3 side, respectively, and make sure that the picture condition on the CRT is normal. On each mode (PAL, NTSC, UNDER SCAN, 16:9, etc.), confirm that the picture condition on the CRT is normal.
H. Size and H. Center adjustment	Signal generator		H. SIZE COIL H. POSI VR H. CENT SW [MAIN PWB]	<ul style="list-style-type: none"> • Perform after completing brightness and contrast adjustments. <ol style="list-style-type: none"> 1. Input a NTSC crosshatch signal. 2. Press the UNDER SCAN SW and the PULSE CROSS SW, then roughly adjust the H. CENT SW to center the picture on the CRT. (At the same time, input PAL crosshatch signal and make sure that the center has not got out of place excessively.) 3. After tuning off the UNDER SCAN SW and the PULSE CROSS SW, adjust the H. POSI VR to center the picture on the CRT. 4. Adjust the H. SIZE COIL to set the horizontal size to 90% (Fig. A) 5. Turn on the UNDER SCAN SW and set the BRIGHT VR to a maximum and the CONTRAST VR to a minimum. Then, adjust the H.POSI VR so that the picture area on the CRT is positioned at the center of the raster. 6. Turn off the UNDER SCAN SW and set the BRIGHT VR and the CONTRAST VR to the click position. Then, make sure that the horizontal position falls within the tolerance. If the horizontal position has been out of place, adjust the H.CENT SW to correct the position.

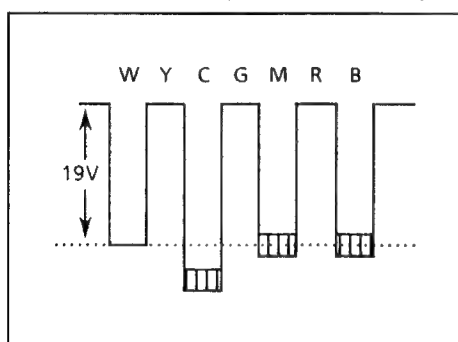


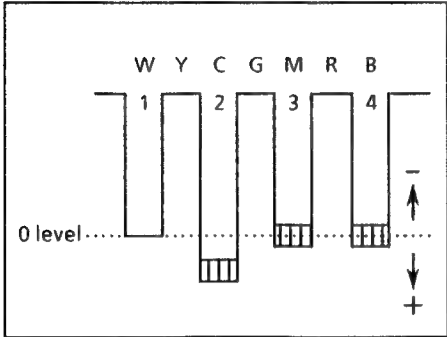
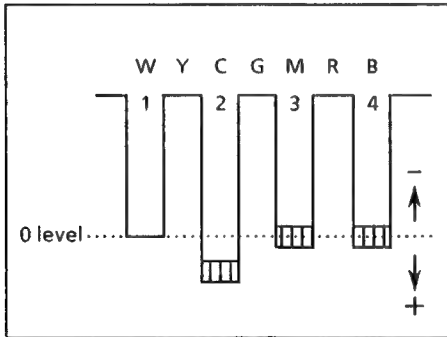
(Fig. A)

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
V. Size V. Center and V. Linearity adjustment	Signal generator		V. SIZE VR V. CENTER VR V. LIN VR [MAIN PWB]	<ul style="list-style-type: none"> Perform after completing brightness and contrast adjustments. 1. Input a NTSC crosshatch circle signal. 2. Adjust Vertical linearity with the V. LIN VR. 3. Adjust the V. CENTER VR to center the Picture on the CRT. 4. Adjust the V. SIZE VR to set the vertical size to 95% (Fig. B). 5. If necessary, readjust the V. LIN VR. 6. Press the UNDER SCAN SW and adjust the V. SIZE UNDER VR so that circle on the screen becomes the same diameter vertically and horizontally. 7. Input the PAL crosshatch circle signal and make sure that the vertical size of the circle falls within 92~97% when the UNDER SCAN SW is turned off, and that the diameter of the circle is the same vertically and horizontally when the UNDER SCAN SW is turned ON.
 <p>(Fig. B)</p>				
Notch circuit adjustment	Signal generator Oscilloscope	[S2] connector 1&3 pin : Signal 2 pin : E (⌋)⌋ [SIGNAL PWB]	NOTCH [SIGNAL PWB]	<ol style="list-style-type: none"> 1. Input a PAL color bar signal. 2. Switch the NTSC / PAL SW on the front panel to the PAL side. 3. Connect an oscilloscope to [S2] connector 1 or 3 pin. 4. Adjust the NOTCH so that the figure is altered to (B) from (A).
				
COMB FILTER adjustment	Signal generator Oscilloscope	[S2] connector 1&3 pin : Signal 2 pin : E (⌋)⌋ [SIGNAL PWB]	DL PHASE TRANSF COMB A.D.J [SIGNAL PWB]	<ol style="list-style-type: none"> 1. Input a NTSC color bar signal. 2. Switch the NTSC / PAL SW [S2] on the front panel to the NTSC side. 3. Connect the oscilloscope to [S2] connector. In case the waveform can be expanded by the oscilloscope, expand the waveform to allow easy adjustment. 4. Adjust the DL PHASE TRANSF so that the CHAROMA element becomes minimum. 5. With the COMB A.D.J, adjust the CHAROMA element so that the element becomes minimum. 6. Repeat steps 3 and 4.
				

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
COLOR SYNC adjustment	Signal generator Oscilloscope		APC SW 1 & 2 NTSC COLOR SYNC [SIGNAL PWB]	<ol style="list-style-type: none"> 1. Input a NTSC color bar signal. 2. Switch the NTSC / PAL SW on the front panel to the NTSC side. 3. Switch the APC SW 1 & 2 to the S side. 4. While adjusting the NTSC COLOR SYNC, observe the picture in the screen : then stop the adjustment when the picture has been changed to a complete color-bar pattern from a striped pattern. 5. Then return the APC SW 1 & 2 to the N side. 6. By switching the input select A / B SW twice, make sure that the complete color-bar pattern obtained in the step 4 above will appear immediately.
APC adjustment	Signal generator Oscilloscope	[S3] connector 1 pin : SIGNAL(B-Y) 2 pin : GND($\frac{1}{2}$) 3 pin : SIGNAL(R-Y)	APC SW 1 & 2 DL LEVEL VR LISSAJOUS 2 & 3 [SIGNAL PWB]	<ol style="list-style-type: none"> 1. Input a PAL color bar signal. 2. Switch the NTSC / PAL SW on the front panel to the PAL side. 3. Connect the probes of a dual-trace oscilloscope to [S3] connector. 4. Set the APC SW 1, SW 2 to S. 5. Set the oscilloscope tie axis to X-Y coordinates. 6. Alternately adjust the DL LEVEL VR and LISSAJOUS 2 & 3 to obtain the waveform B indicated in the figure. 7. Return the APC SW1, SW2 to N.
<div style="text-align: center;">  <p>(A) Adjust (B)</p> </div>				
White balance (low Light) adjustment	Signal generator		SET UP SW [SIGNAL PWB] R CUT OFF VR G CUT OFF VR B CUT OFF VR [CRT SOCKET PWB] SCREEN VR [MAIN PWB]	<ol style="list-style-type: none"> 1. Input a monoscope pattern signal. 2. Set the SET UP SWITCH on the signal PWB to S to produce a single horizontal line. 3. Turn the RED, GREEN and BLUE CUT OFF VRs fully counter-clockwise. 4. Turn the SCREEN VR fully counter-clockwise, then gradually turn it clockwise until a single blue, green or red horizontal line just slightly appears. 5. Turn the CUT OFF VR corresponding to the initial color slightly clockwise. 6. Adjust the CUT OFF VRs of the other two colors to where the three overlapped colors appear white. 7. Return the SET UP SWITCH to normal(N). 8. Set for a dark screen and fine adjust the R, G and B CUT OFF VRs to obtain the optimum white color.

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
White balance (high light) adjustment	Signal generator (color temperature meter)		R DRIVE VR G DRIVE VR [CRT SOCKET PWB]	<ol style="list-style-type: none"> 1. Input a monoscope pattern signal. 2. Adjust the RED and GREEN DRIVE VRs to produce an overall white screen. <ul style="list-style-type: none"> • If a color temperature meter is available : Measure the center of the screen with the sensor of the color temperature meter. Adjust the RED and GREEN DRIVE VRs to obtain D6500° K. 3. Turn the contrast and brightness VRs. Confirm correct white balance tracking from low light to high light.
Brightness adjustment	Signal generator		SUB BRIGHT VR [CONTROL PWB]	<ul style="list-style-type: none"> • Perform after completing white balance adjustments. <ol style="list-style-type: none"> 1. Input a split color bar signal. 2. Adjust the SUB BRIGHT VR to eliminate illumination in the +2% black component.
Contrast adjustment	Signal generator Oscilloscope	TP-47B TP-E(↗) [CRT SOCKET PWB]	SUB CONT. VR [CONTROL PWB]	<ol style="list-style-type: none"> 1. Input a colour bar signal (set for 0.525V between black and white). 2. Connect an oscilloscope to TP-47B and TP-E(↗). 3. Adjust the SUB CONTRAST VR to set the level indicated in the figure to 19V.



Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
Chroma adjustment	Signal generator Oscilloscope	TP-47B TP-E1(⚡) [CRT SOCKET PWB]	SUB CHROMA VR [CONTROL PWB]	<ol style="list-style-type: none"> 1. Input a PAL color bar signal. 2. Switch the NTSC / PAL SW on the front panel to the PAL side. 3. Connect an oscilloscope to TP-47B and TP-E1 (⚡). 4. With the no. 1 level W taken as 0 level, adjust the SUB CHROMA (PAL) VR to set no. 4 B to 0 level.
				
COLOR TINT adjustment	Signal generator Oscilloscope	TP-47B TP-E(⚡) [CRT SOCKET PWB]	SUB PHASE VR SUB CHAROMA VR [CONTROL PWB]	<ol style="list-style-type: none"> 1. Input a NTSC color bar signal. 2. Switch the NTSC / PAL SW on the front panel to the PAL side, and turn the BLUE CHECK SW on. 3. Connect an oscilloscope to TP-47B and TP-E (⚡). 4. With the no. 1 level W taken as 0 level, adjust the SUB PHASE VR to set no. 3 M to 0 level. 5. With the no. 1 level W taken as 0 level, adjust the SUB CHROMA (NTSC) VR to set no. 4 B to 0 level.
				

PURITY, CONVERGENCE

PURITY ADJUSTMENT

Before adjusting :

- Turn the screen VR to where the raster dose not appear.
- Set the PULSE CROSS SW to ON and turn BRIGHT VR to MAX, allow to run for at least 30 minutes, then return the switch to OFF and BRIGHT VR to back.
- Set the screen VR to the original position.

1. Demagnetize CRT with the demagnetizer.
2. Loosen the retainer screw of the deflection yoke.
3. Remove the wedge.
4. Input a Green Raster signal from the Signal Generator, and turn the screen to Green Raster.
5. Move the deflection yoke backward.
6. Bring the long lug of the purity magnets on the short lug and position them horizontally. (Fig. 3)
7. Adjust the gap between two lugs so that the Green Raster will come into the center of the screen. (Fig. 4)
8. Move the deflection yoke forward, and fix the position of the deflection yoke so that the whole screen will become green.
9. Insert the wedge to the top side of the deflection yoke so that it will not move.
10. Input a crosshatch signal.
11. Verify that the screen is horizontal.
12. Input red and Blue Raster signals, and make sure that purity is properly adjusted.

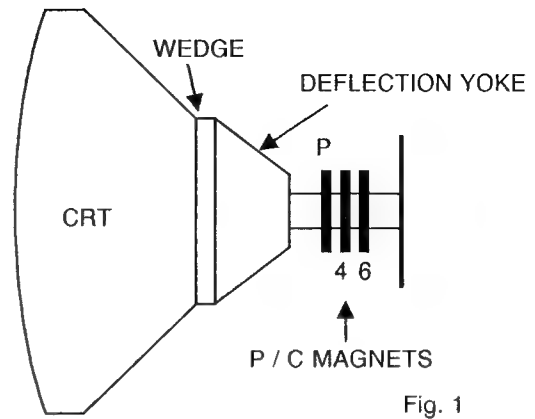


Fig. 1

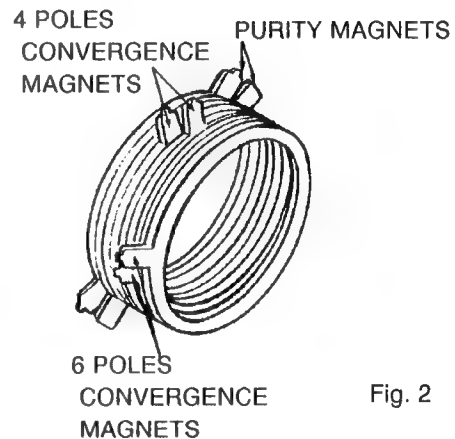


Fig. 2

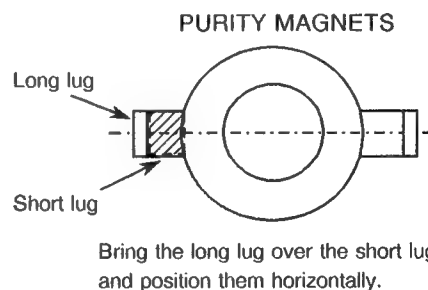


Fig. 3

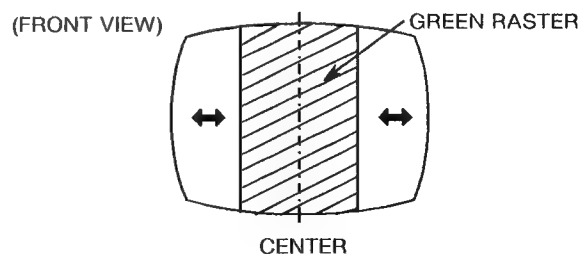


Fig. 4

STATIC CONVERGENCE ADJUSTMENT

1. Input a crosshatch signal.
2. Using 4-pole convergence magnets, overlap the red and blue lines in the center of the screen and turn them to magenta (red/blue).
3. Using 6-pole convergence magnets, overlap the magenta (red/blue) and green lines in the center of the screen and turn them to white.
4. Repeat 2 and 3 above, and make best convergence.

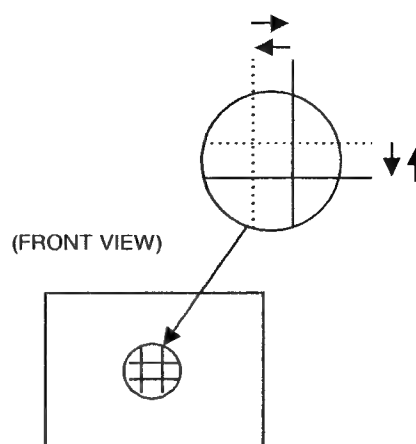


Fig. 1

DYNAMIC CONVERGENCE ADJUSTMENT

1. Move the deflection yoke up and down and overlap the lines in the periphery. (Fig. 2)
2. Move the deflection yoke left to right and overlap the lines in the periphery. (Fig. 3)
3. Repeat 1 and 2 above, and make best convergence.

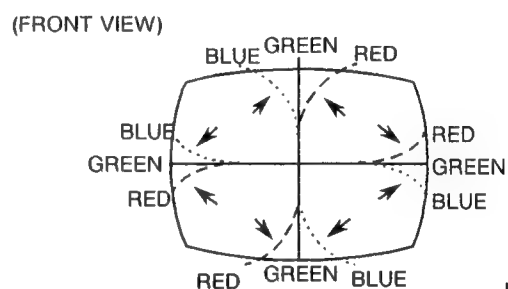


Fig. 2

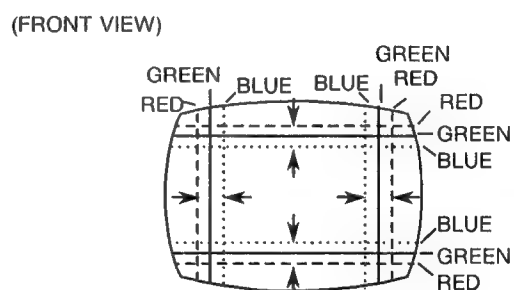


Fig. 3

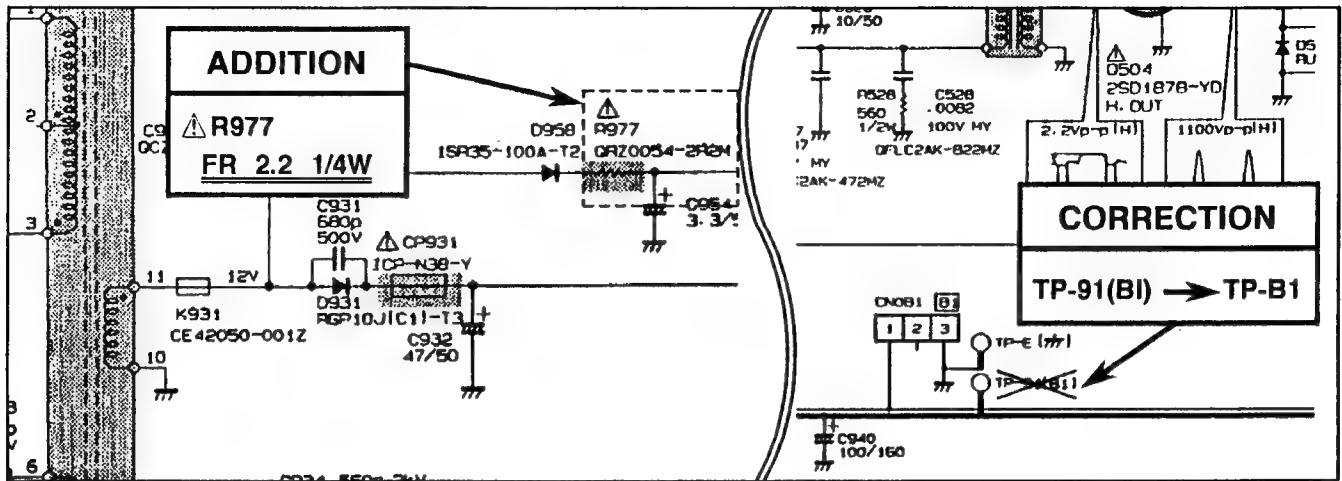
- After adjustment, fix the wedge at the original position.
Fasten the retainer screw of the deflection yoke.
Fix the 6 magnets with glue.

CORRECTION

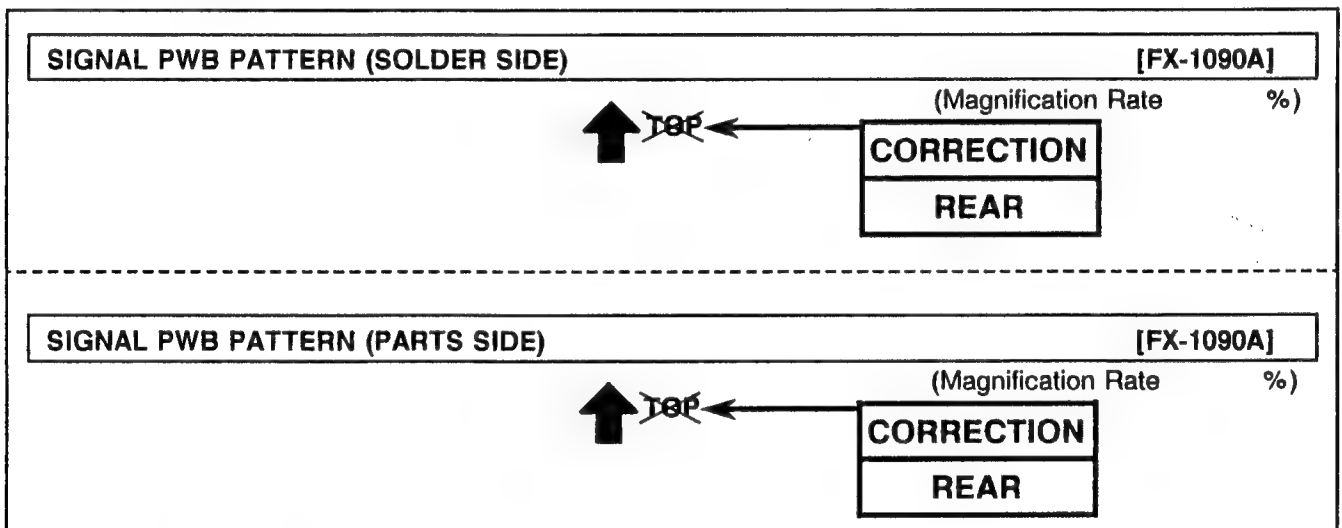
[TM-910SU]

STANDARD CIRCUIT DIAGRAM

(1) MAIN PWB ASS'Y (Page 2-9 ~ Page 2-10)



(2) SIGNAL PWB PATTERN (Page 2-11 & Page 2-12)



PARTS LIST

(3) MAIN CRT SOCKET PW BOARD ASS'Y (FX-2051A) (Page 28)

ADDITION

⚠

Q2935	2SA1309A(QR)-T	SI. TRANSISTOR
Q2953	2SC1627A(Y)-T	SI. TRANSISTOR
Q2954	2SC2750(L)	SI. TRANSISTOR
I C		
IC2401	LA7830	I.C. (MONO-ANA)
IC2402	TC4052BP	I.C. (DIGI-MOS)
IC2501	HA11423	I.C. (MONO-ANA)
IC2502	AN7812F	I.C. (MONO-ANA)
IC2931	S1854-C1	I.C. (MONO-ANA)
IC2952	TA78012AP	I.C. (MONO-ANA)
O T H E R S		
⚠ CP2931	ICP-N38-Y	I.C. PROTECT
⚠ F2951	QMF51U1-4R0S	FUSE
K2401-02	CE41433-001Z	BEADS CORE
K2901	CE42050-001Z	CORE

4.0A


4.0A



TM-910SU STANDARD CIRCUIT DIAGRAM

■ NOTE ON USING CIRCUIT DIAGRAMS

1. SAFETY

The components identified by the  symbol and shading are critical for safety. For continued safety replace safety critical components only with manufactures recommended parts.

2. SPECIFIED VOLTAGE AND WAVEFORM VALUES

The voltage and waveform values have been measured under the following conditions.

- (1) Input signal : Color bar signal
 - (2) Setting positions of each knob/button and variable resistor : Original setting position when shipped
 - (3) Internal resistance of tester : DC 20k Ω /V
 - (4) Oscilloscope sweeping time : H \Rightarrow 20 μ S/div
: V \Rightarrow 5mS/div
: Others \Rightarrow Sweeping time is specified
 - (5) Voltage values : All DC voltage values
- * Since the voltage values of signal circuit vary to some extent according to adjustments, use them as reference values.

3. INDICATION OF PARTS SYMBOL [EXAMPLE]

- In the PW board : R1209 \rightarrow R209

4. INDICATIONS ON THE CIRCUIT DIAGRAM

(1) Resistors

• Resistance value

- No unit : [Ω]
- K : [K Ω]
- M : [M Ω]

• Rated allowable power

- No indication : 1/6[W]
- Others : As specified

• Type

- No indication : Carbon resistor
- OMR : Oxide metal film resistor
- MFR : Metal film resistor
- MPR : Metal plate resistor
- UNFR : Uninflamable resistor
- FR : Fusible resistor

* Composition resistor 1/2 [W] is specified as 1/2S or Comp.

(2) Capacitors

• Capacitance value

- 1 or higher : [pF]
- less than 1 : [μ F]

• Withstand voltage

- No indication : DC 50[V]
- Others : DC withstand voltage[V]
- AC indicated : AC withstand voltage[V]

* Electrolytic Capacitors

- 47/50 [Example]: Capacitance value [μ F]/withstand voltage[V]




• Type

- No indication : Ceramic capacitor
- MY : Mylar capacitor
- MM : Metalized mylar capacitor
- PP : Polypropylene capacitor
- MPP : Metalized polypropylene capacitor
- MF : Metalized film capacitor
- TF : Thin film capacitor
- BP : Bipolar electrolytic capacitor
- TAN : Tantalum capacitor

(3) Coils



- No unit : [μ H]
- Others : As specified

(4) Power Supply




-  : B1
-  : B2(12V)
-  : 5V

* Respective voltage values are indicated.





(5) Test Point

-  : Test point
-  : Only test point display



(6) Connecting method

-  : Connector
-  : Wrapping or soldering
-  : Receptacle

(7) Ground symbol

-  : LIVE side ground
-  : ISOLATED(NEUTRAL) side ground
-  : EARTH ground
-  : DIGITAL ground

5. NOTE FOR REPAIRING SERVICE

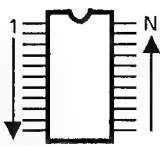
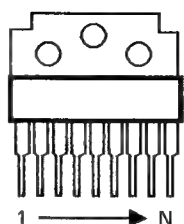
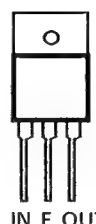
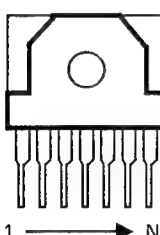
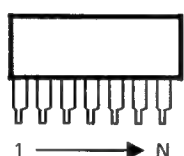

This model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : () side GND and the ISOLATED(NEUTRAL) : () side GND. Therefore, care must be taken for the following points.

- (1) Do not touch the LIVE side GND or the LIVE side GND and the ISOLATED(NEUTRAL) side GND simultaneously. If the above caution is not respected, an electric shock may be caused. Therefore, make sure that the power cord is surely removed from the receptacle when, for example, the chassis is pulled out.
- (2) Do not short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or never measure with a measuring apparatus (oscilloscope, etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND at the same time. If the above precaution is not respected, a fuse or any parts will be broken.


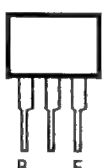
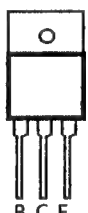
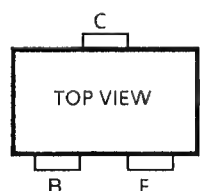
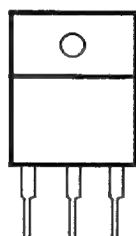
◇ Since the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.

SEMICONDUCTOR SHAPES

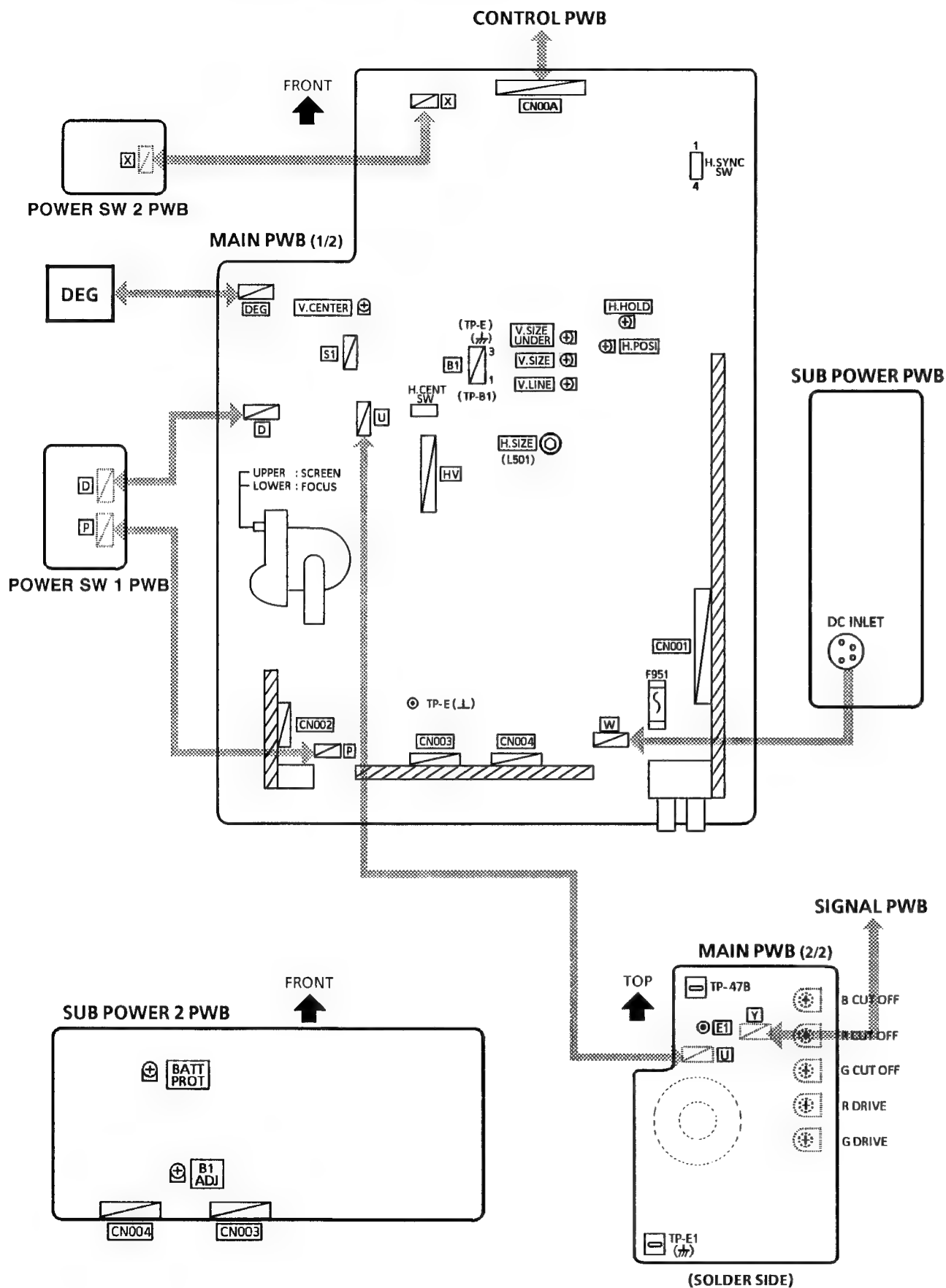
ICs

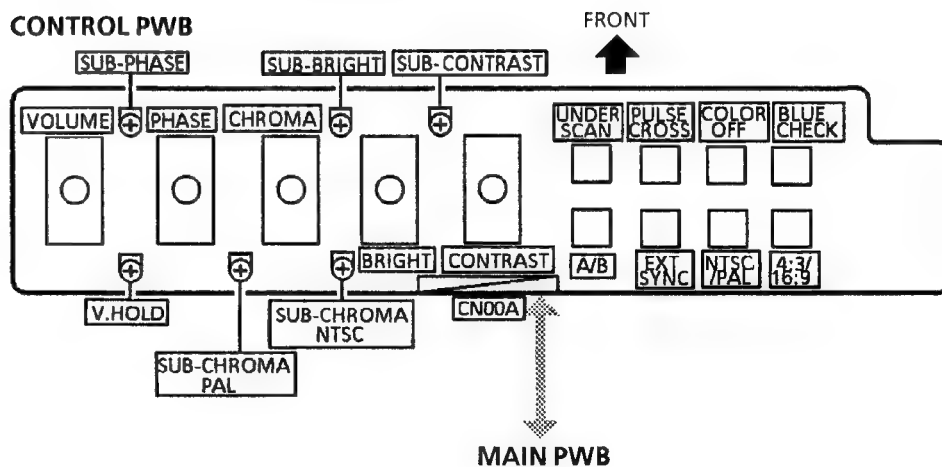
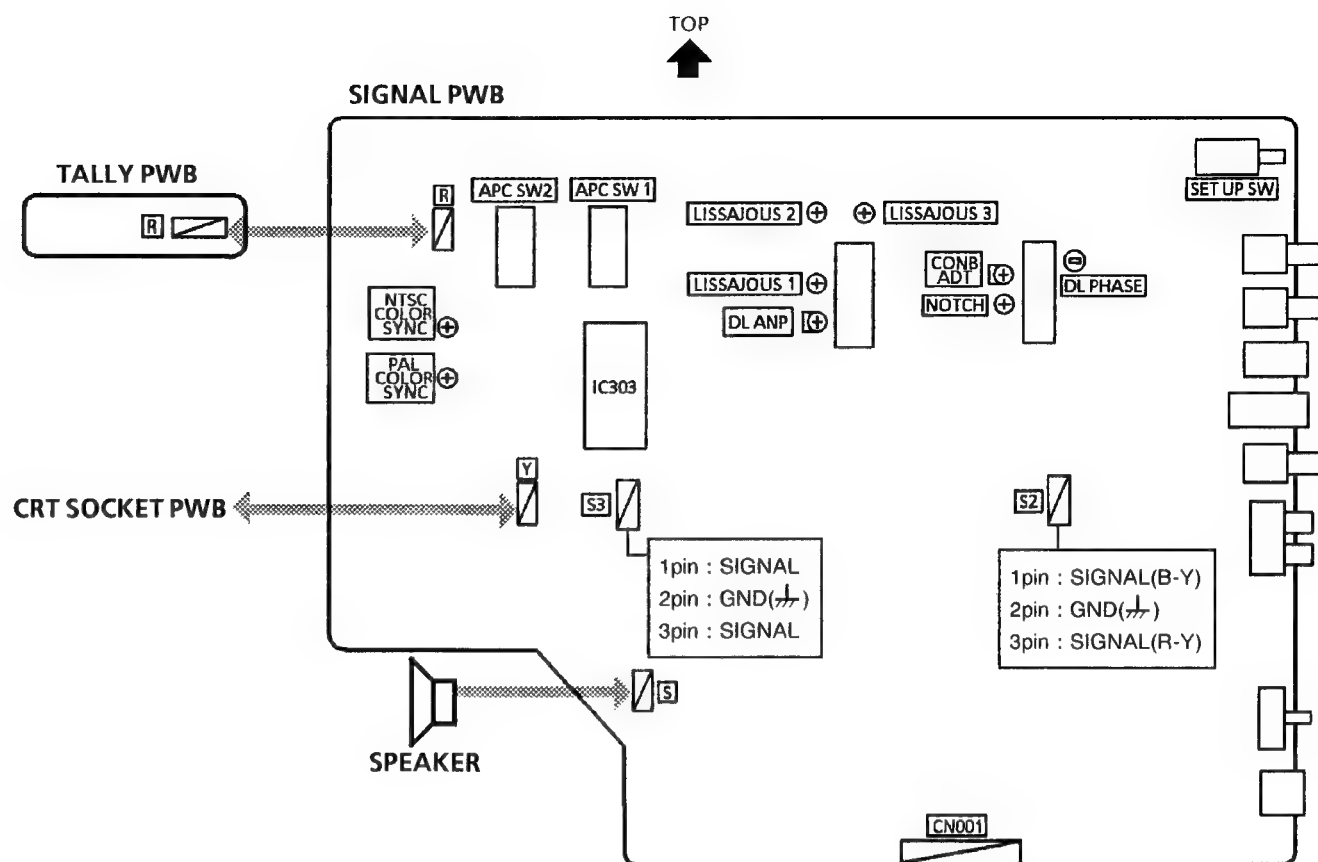
 <p>AN5265 AN5613 HA11423 TC4538BF TC4052BP TC4066BF UPC4558C</p>	 <p>AN5265</p>	 <p>AN7812F</p>
 <p>LA7830</p>	 <p>LA7016 AN5900 AN8026</p>	 <p>S1854-C1 TA7012AP</p>

TRANSISTORS

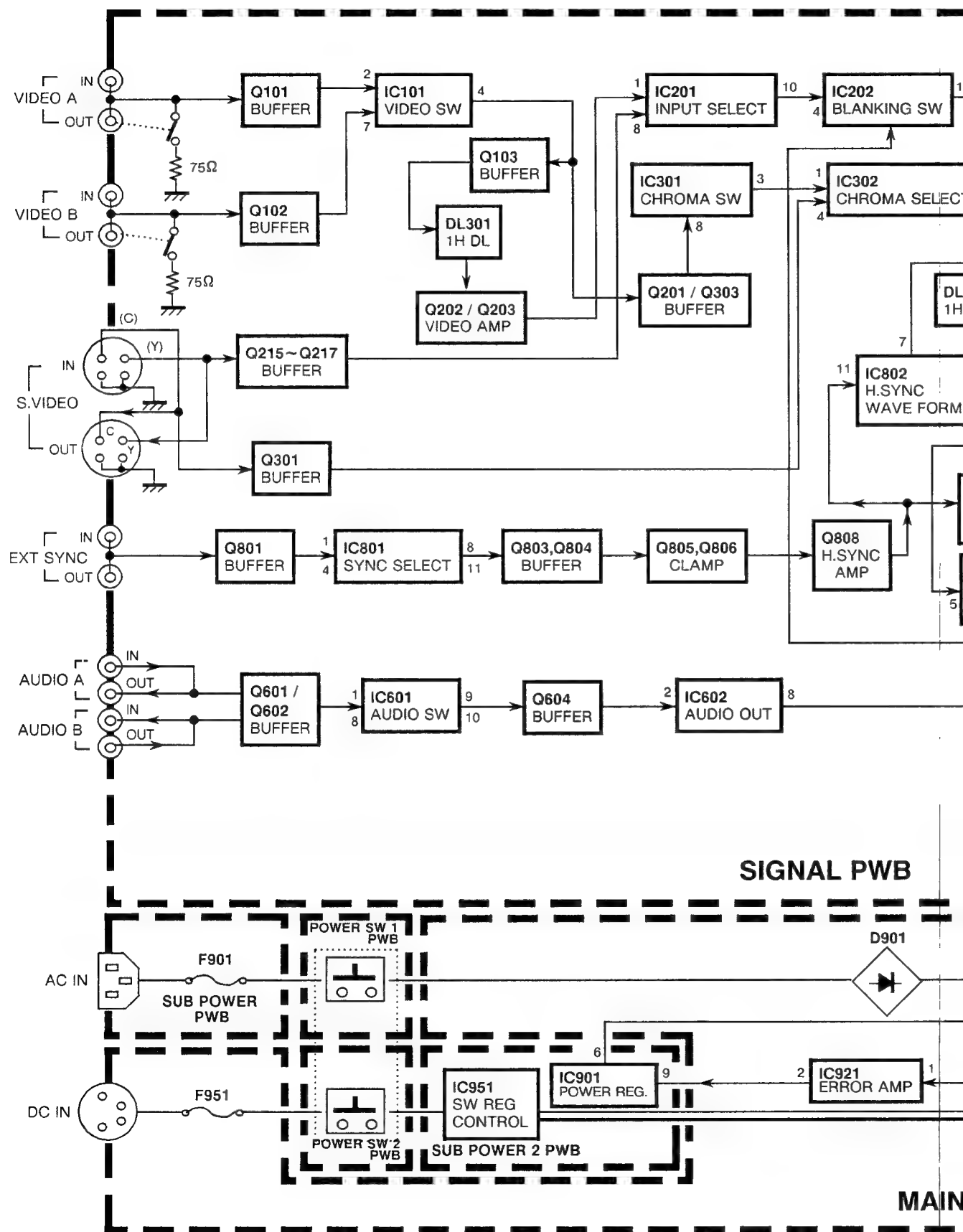
<p>Bottom View</p>  <p>2SA1015(YG)-T 2SA1309 2SA1370(E) 2SA562TM 2SC1472K 2SC1815(YG)-T 2SC1959(Y) 2SC2655(Y)-T 2SC3187-T</p>	 <p>2SC1309A(QR) 2SC3311A(QR) DTC124ES-T DTC124ESA-T</p>	 <p>2SC2750(L)</p>
<p>(Chip Transistor)</p>  <p>2SA1037K(QR) 2SC2412K(QR) DTC144EKA</p>	 <p>IRFIBC40G IRF620 2SD1878-YD</p>	

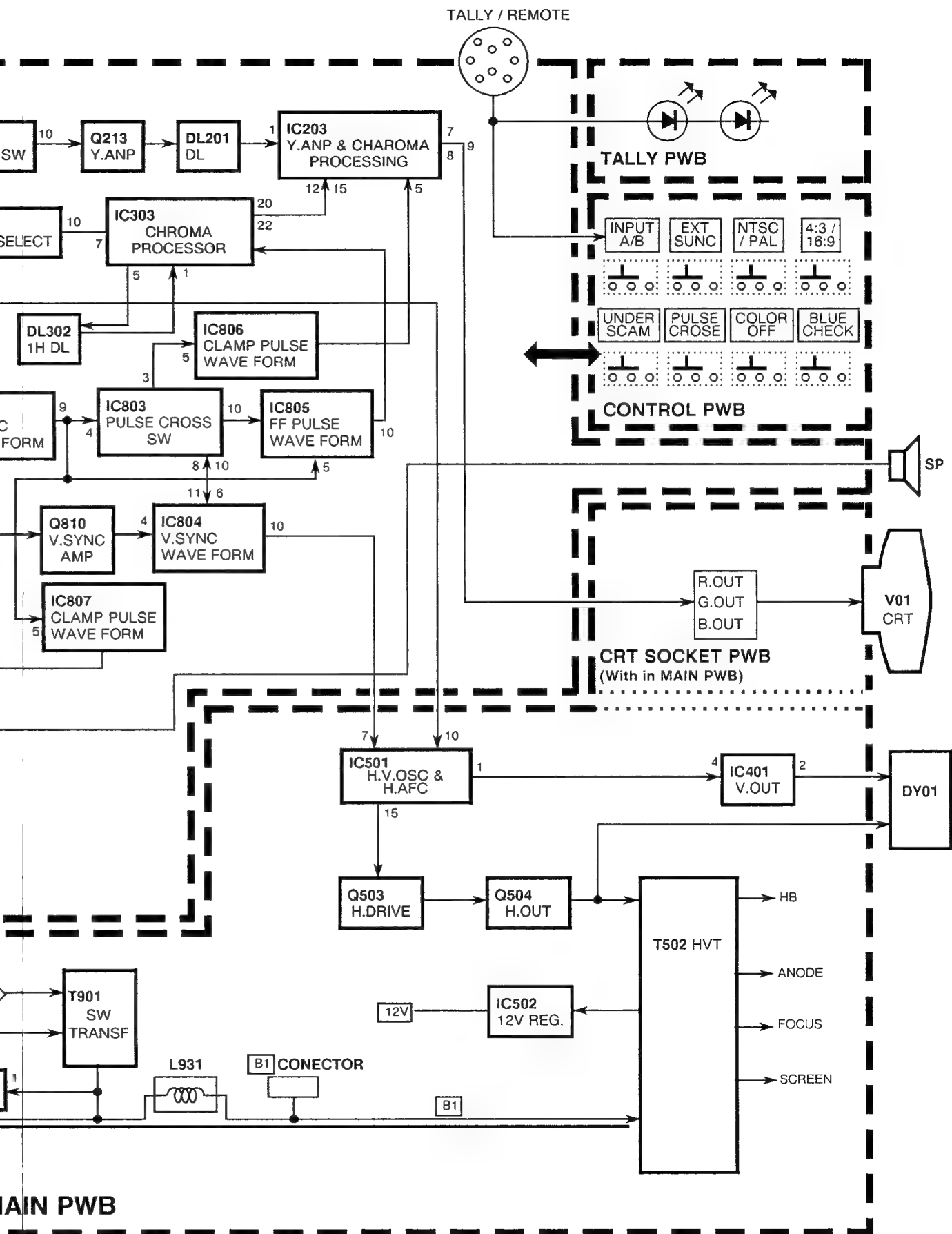
MAIN PARTS LOCATION AND ALIGNMENTS LOCATION





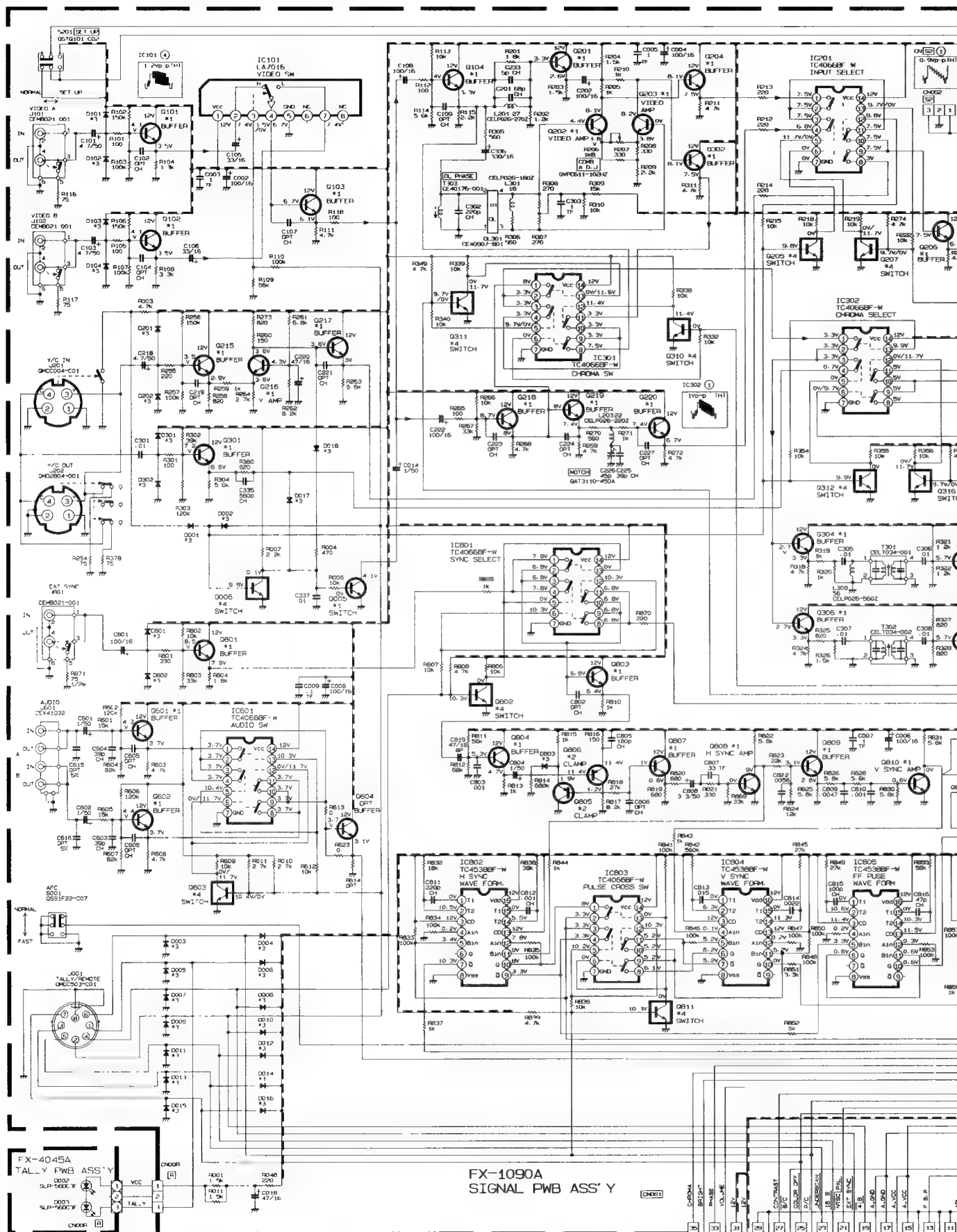
BLOCK DIAGRAM



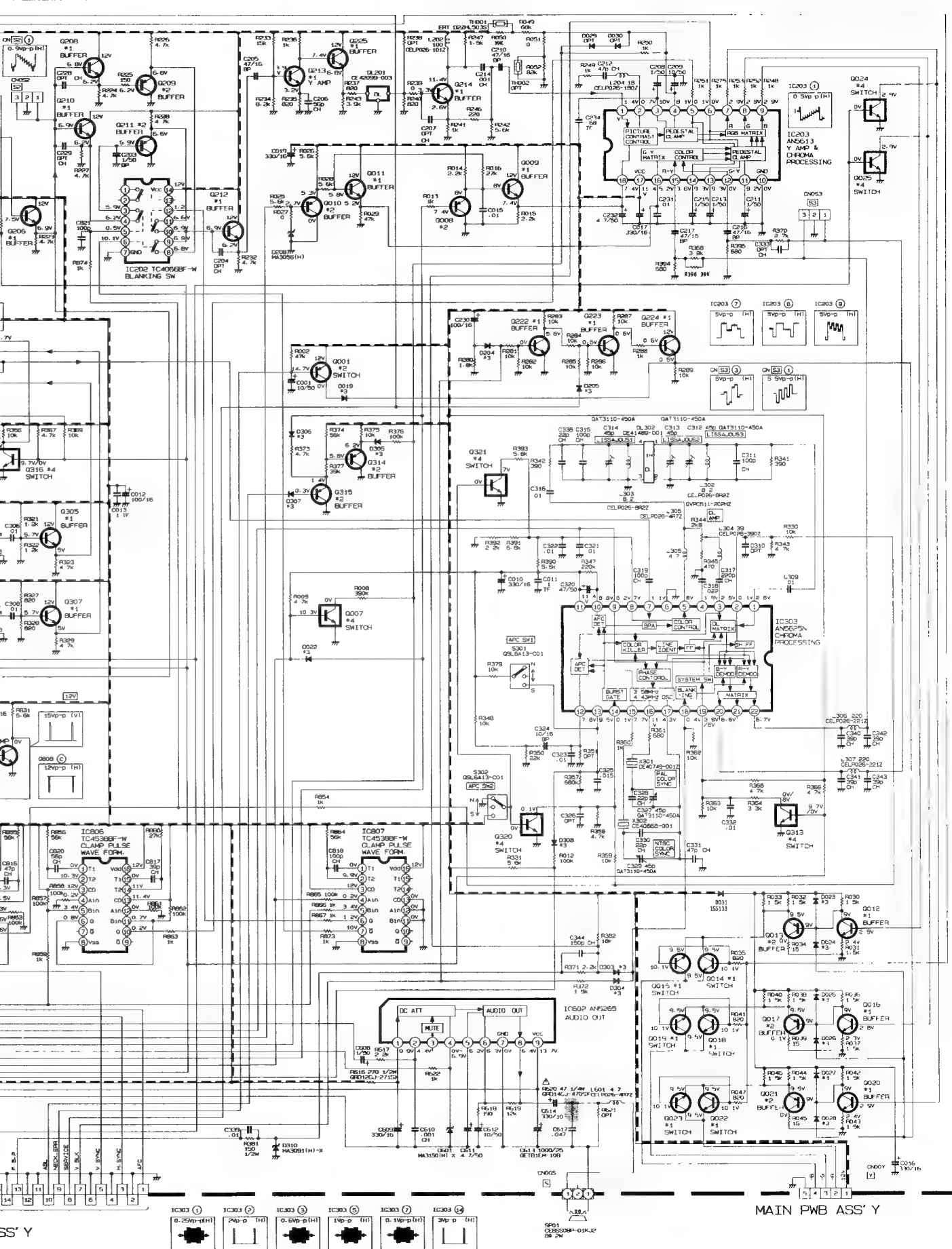


CIRCUIT DIAGRAMS AND PWB PATTERNS

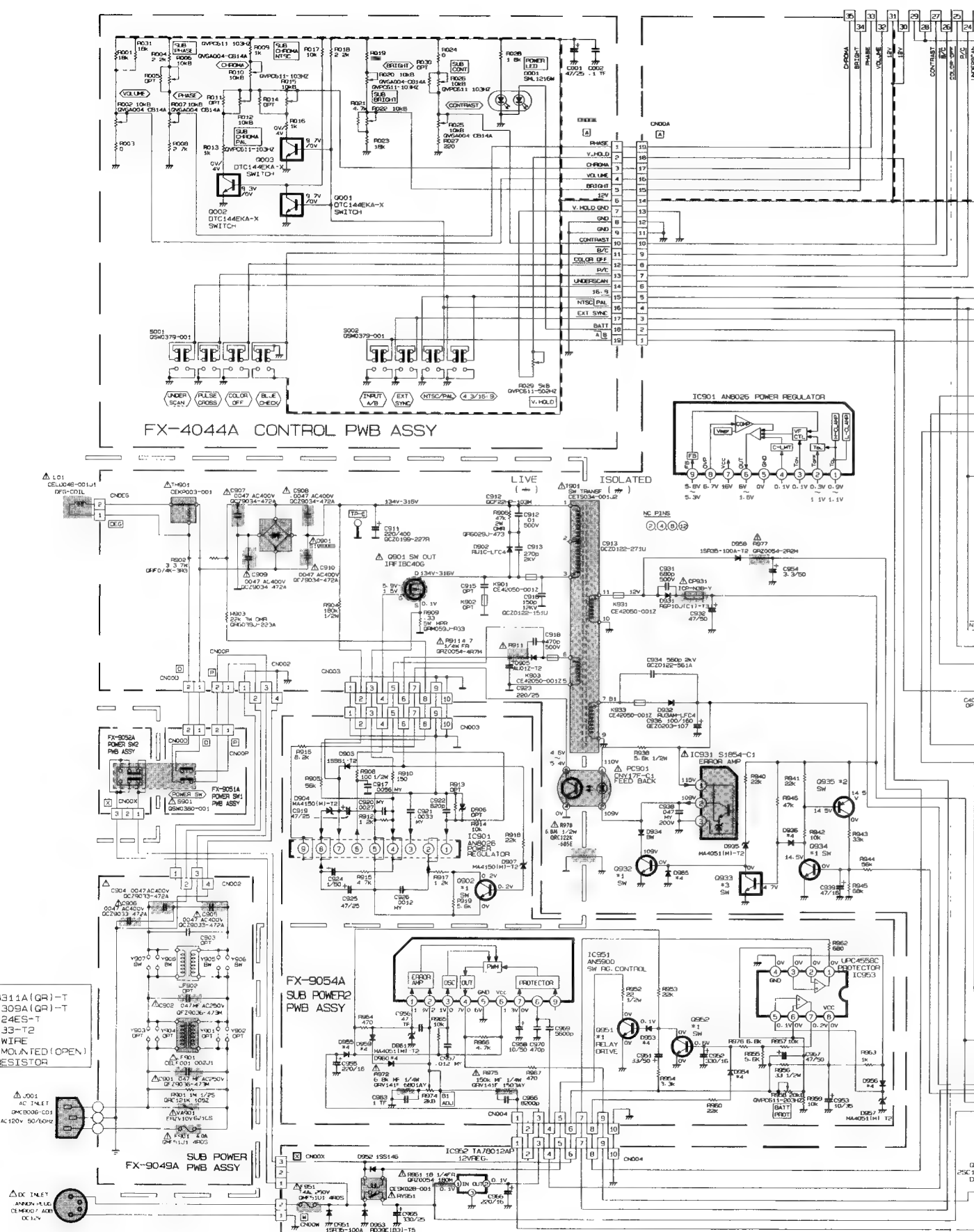
SIGNAL PWB, TALLY PWB CIRCUIT DIAGRAM



Refer to the following PWB pattern : SIGNAL PWB PATTERN 2-11~2-12 page.
TALLY PWB 2-15 page.



**MAIN PWB (1/2), CRT SOCKET PWB(2/2), CONTROL PWB, SUB POWER PWB, SUB POWER2 PWB,
POWER SW1 PWB, POWER SW2 PWB, CIRTCUIT DIAGRAMS**

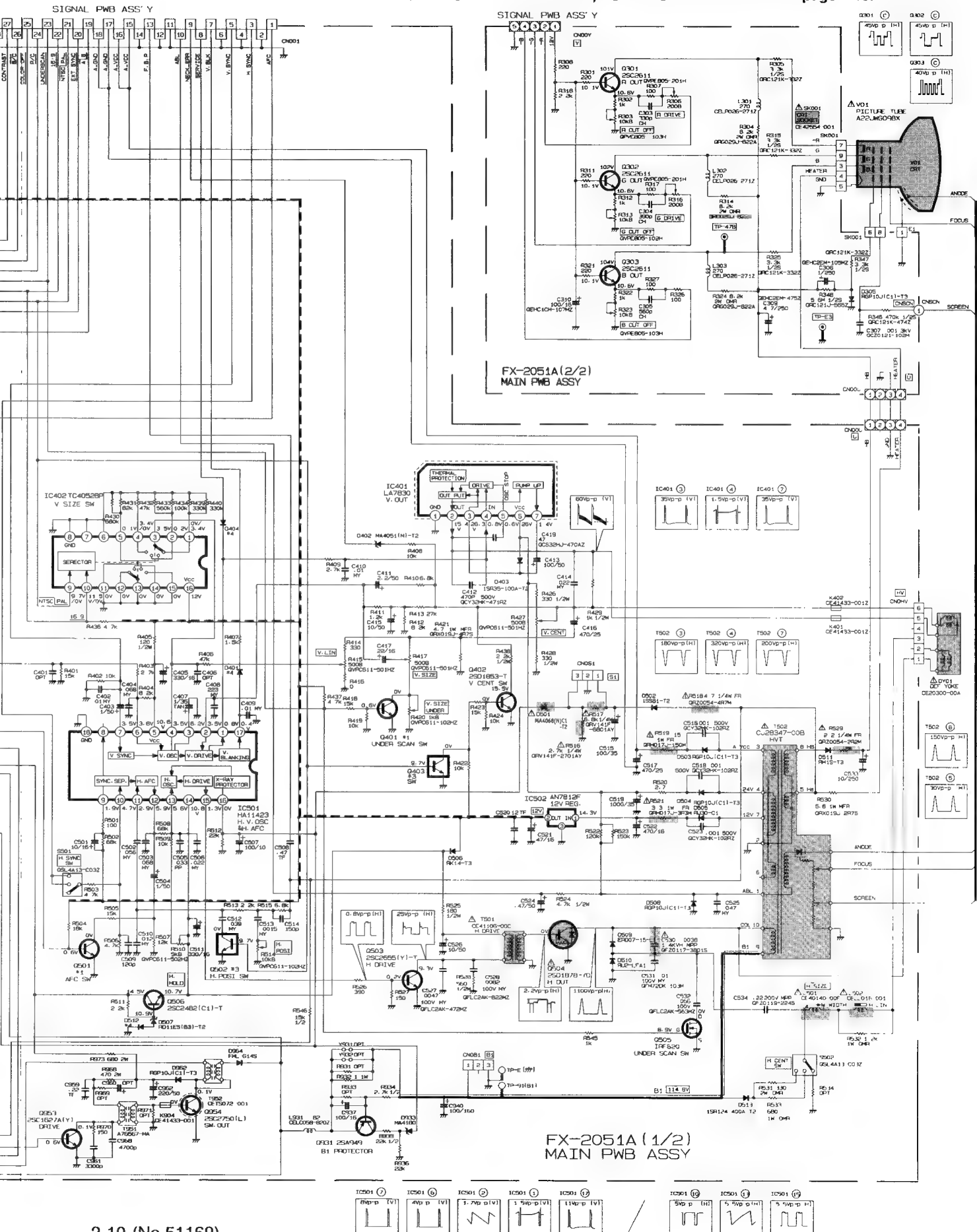


Refer to the following PWB pattern : MAIN PWB PATTERN(1/2) page 2-13~2-14. CONTROL PWB PATTERN page 2-16.

CRT SOCKET PWB PATTERN(2/2) page 2-15.

SUB POWER PWB PATTERN, SUB POWER2 PWB PATTERN page 2-14.

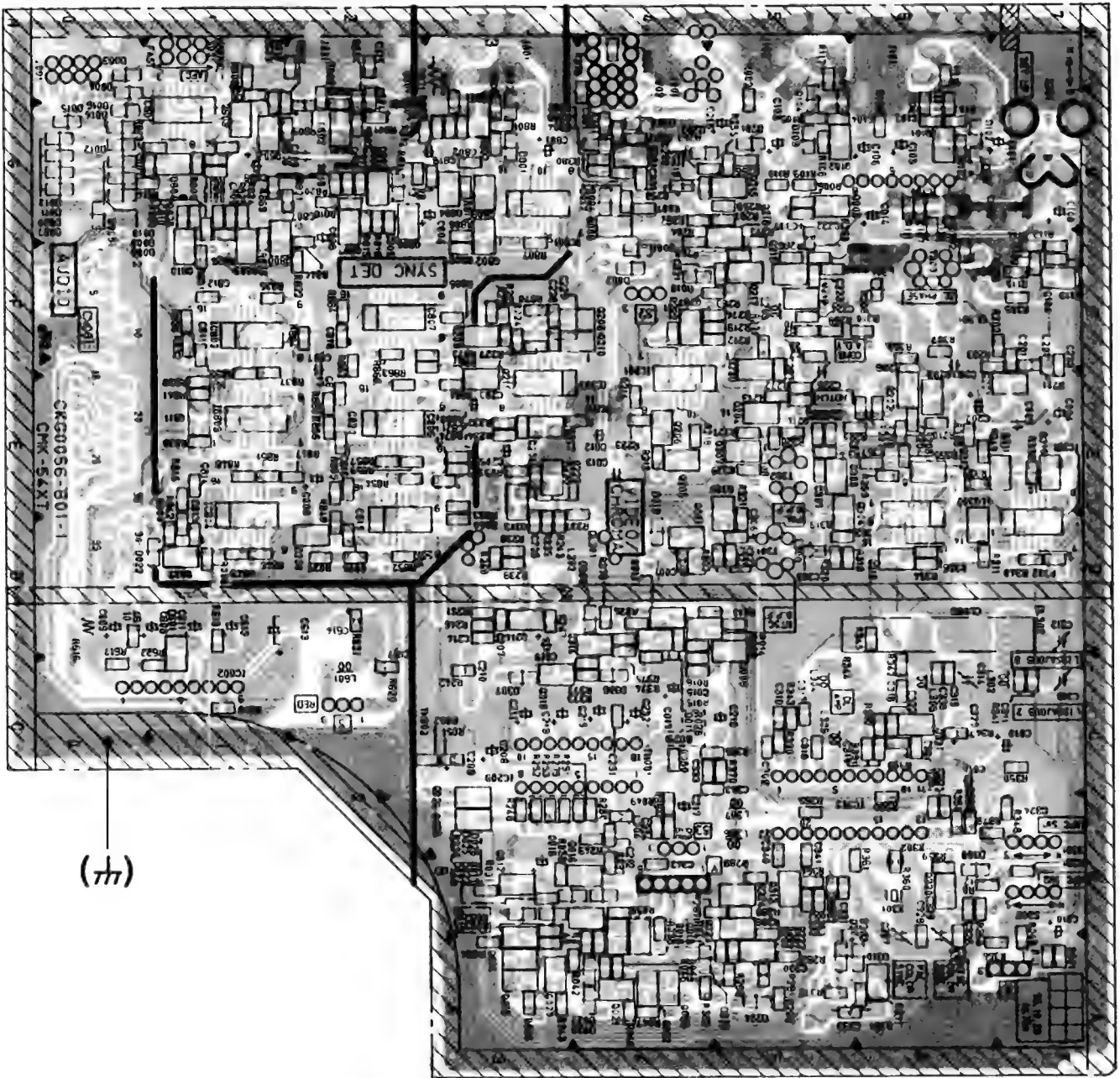
POWER SW1 PWB PATTERN, POWER SW2 PWB PATTERN page 2-15.



SIGNAL PWB PATTERN (SOLDER SIDE)

[FX-1090A]

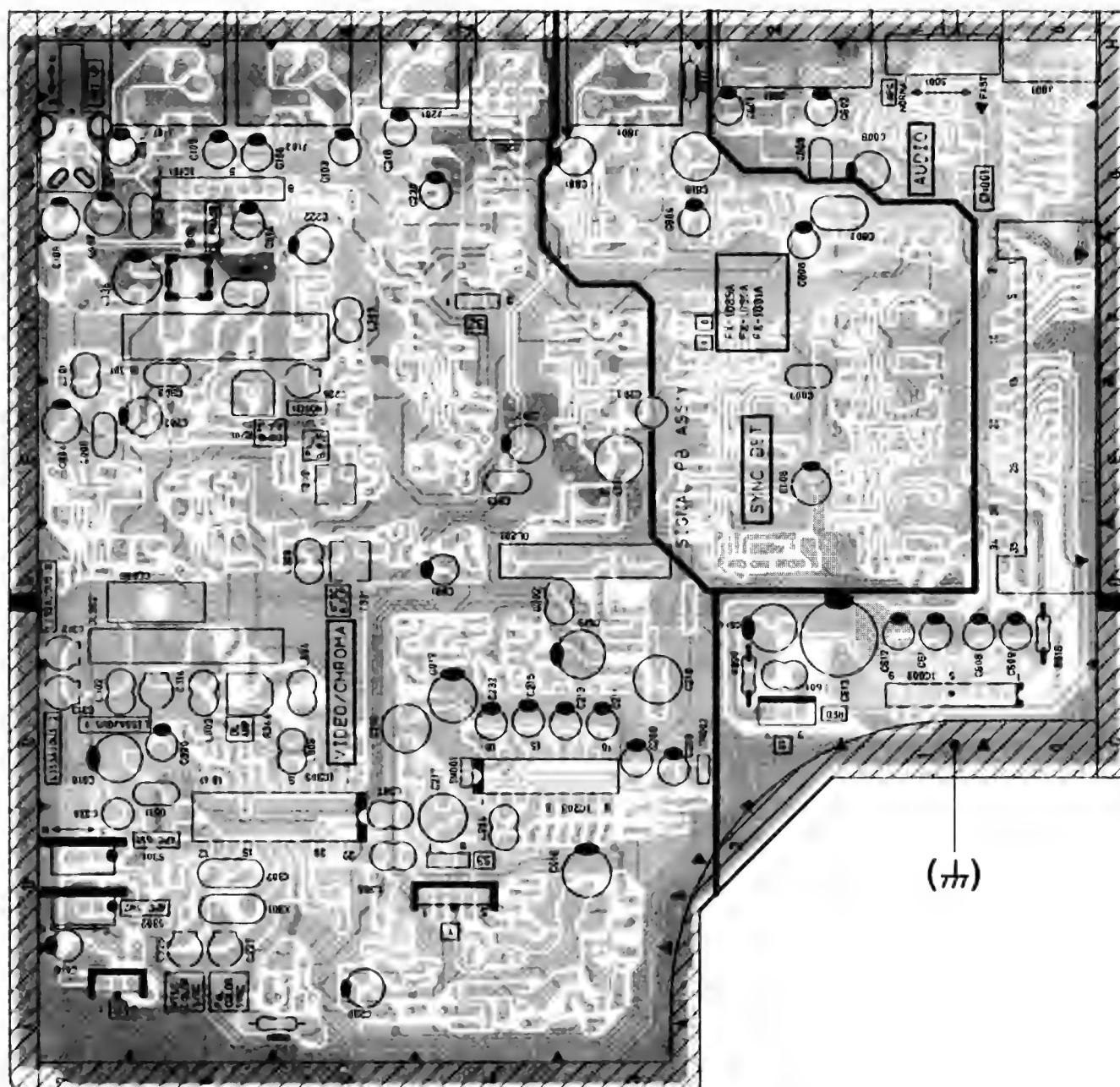
(Magnification Rate 89%)

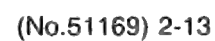


SIGNAL PWB PATTERN (PARTS SIDE)

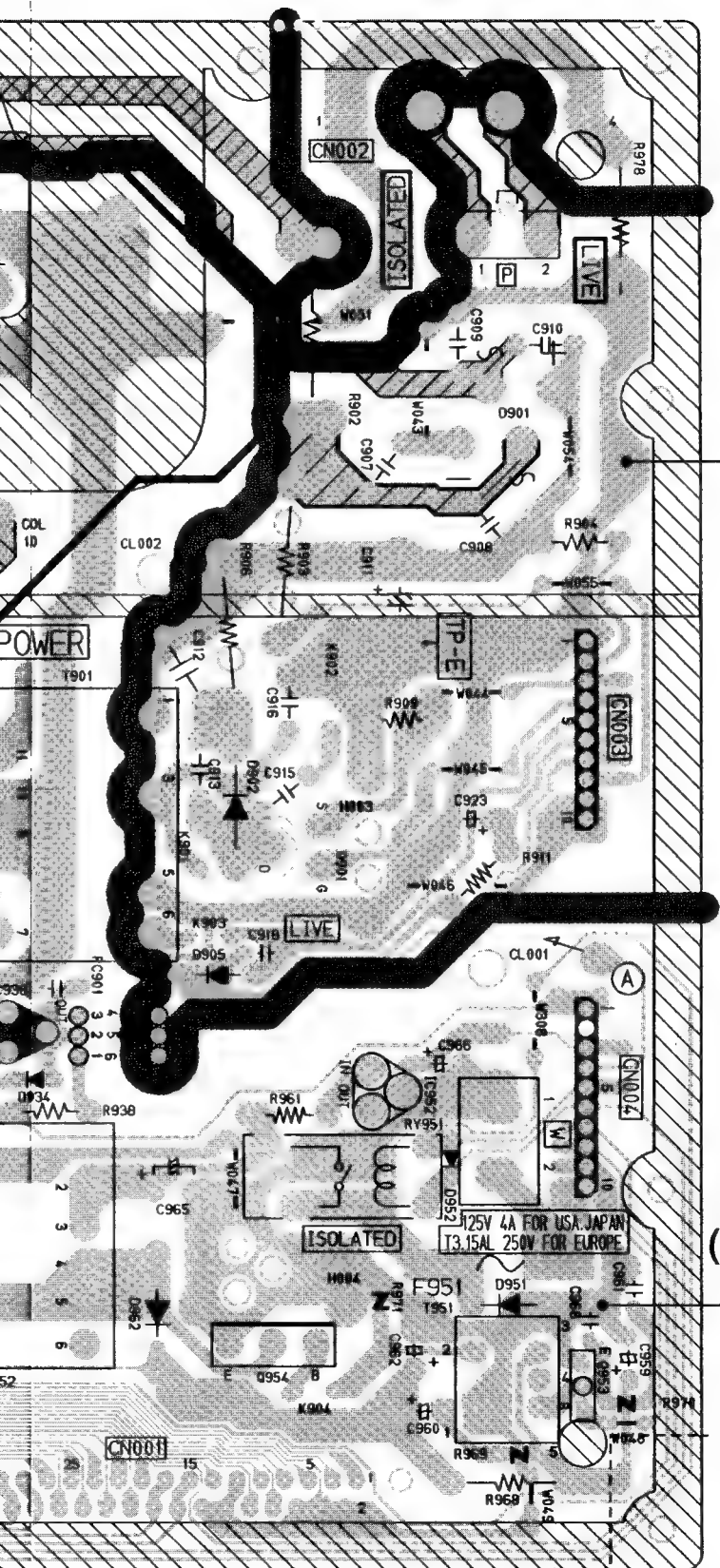
[FX-1090A]

(Magnification Rate 89%)





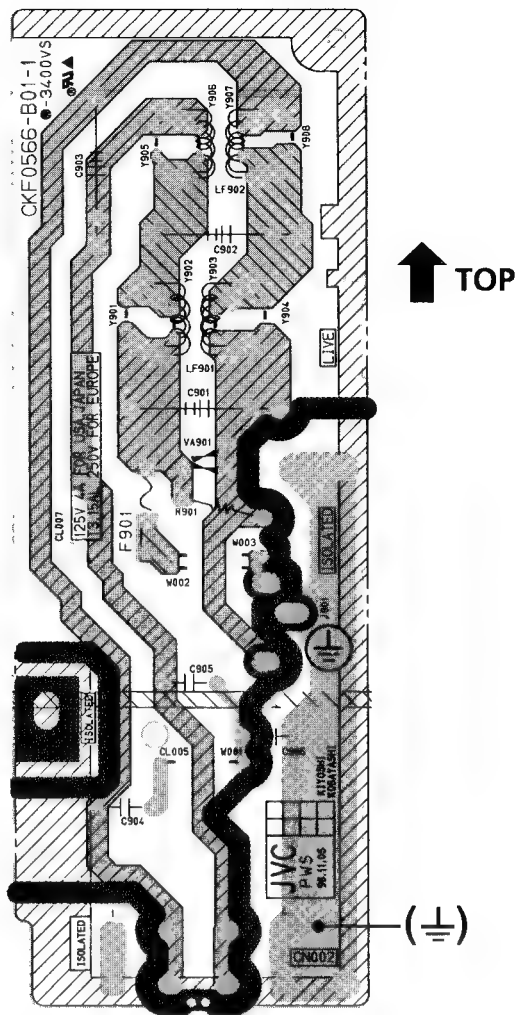
(Magnification Rate 110%)



SUB POWER PWB PATTERN

[FX-9049A]

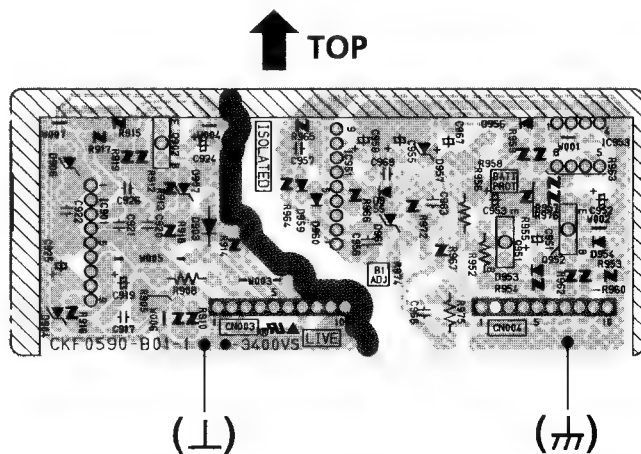
(Magnification Rate 75%)



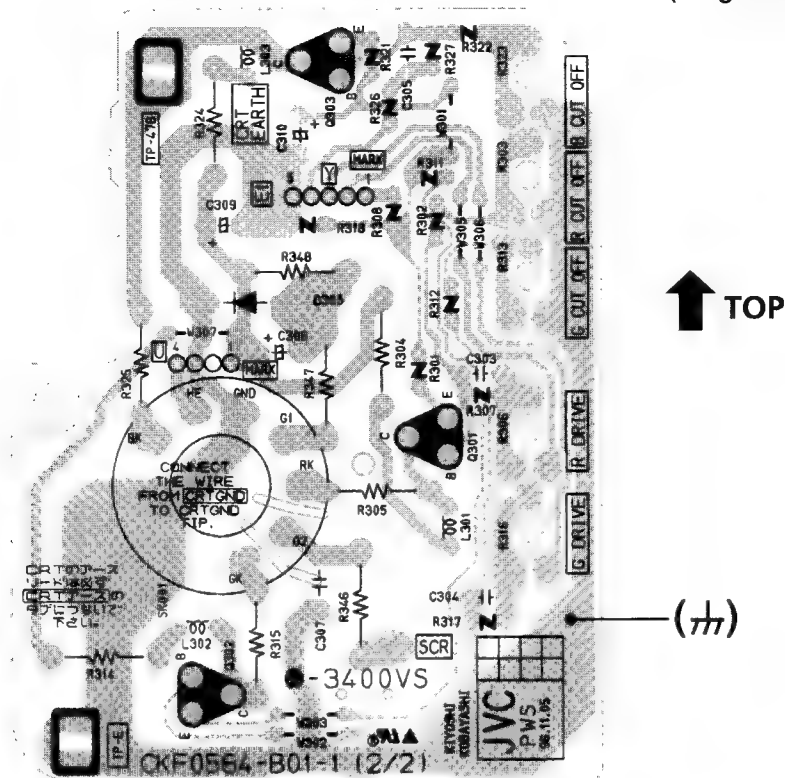
SUB POWER2 PWB PATTERN

[FX-9054A]

(Magnification Rate 75%)



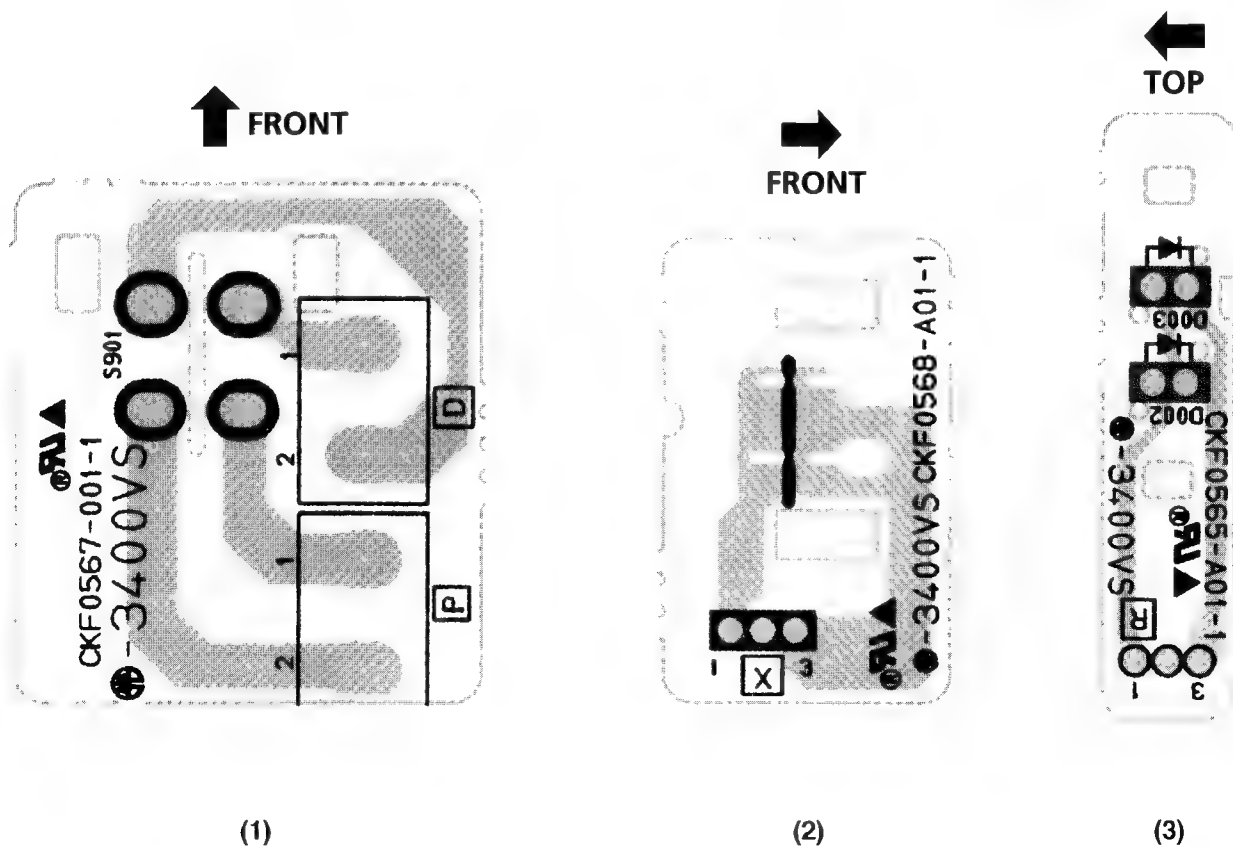
(Magnification Rate 95%)



POWER SW1 PWB PATTERN (1)
POWER SW2 PWB PATTERN (2)
TALLY PWB PATTERN (3)

[FX-9051A]
[FX-9052A]
[FX-4045A]

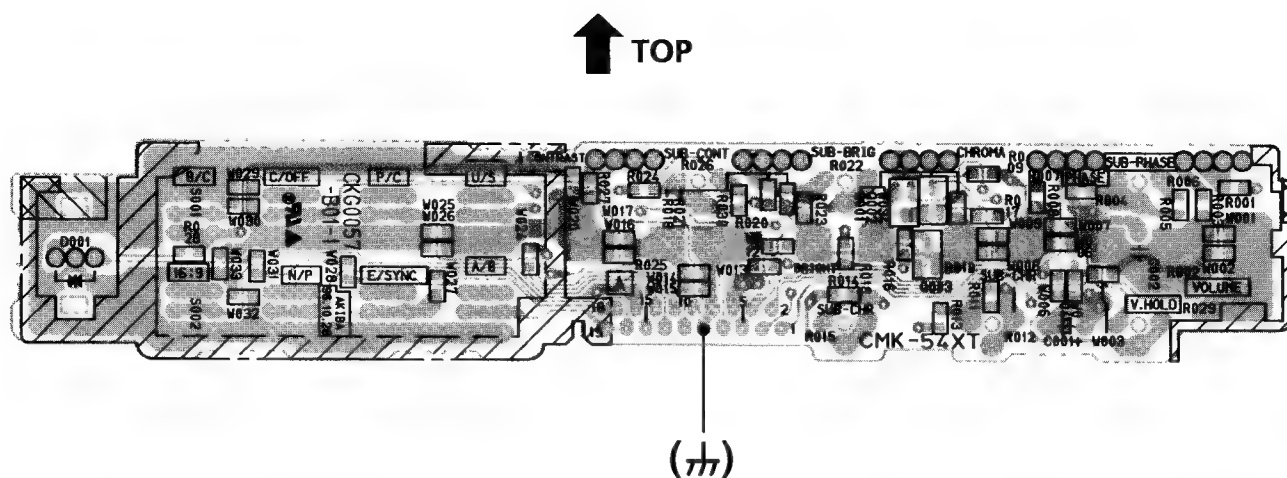
(Magnification Rate 170%)



CONTROL PWB PATTERN (SOLDER SIDE) [FX-4044A]

[FX-4044A]

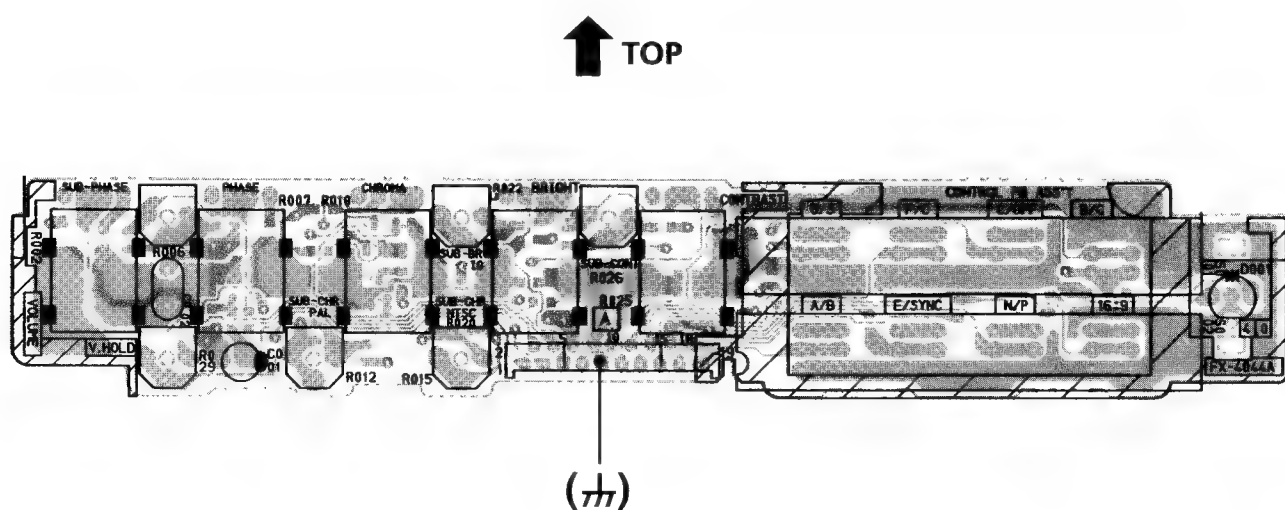
(Magnification Rate 103%)



CONTROL PWB PATTERN (PARTS SIDE) [FX-4044A]

[FX-4044A]

(Magnification Rate 103%)



PARTS LIST

CAUTION

- The parts identified by the \triangle symbol are important for the safety . Whenever replacing these parts, be sure to use specified ones to secure the safety .
- The parts not indicated in this Parts List and those which are filled with lines — in the Parts No. columns will not be supplied .
- P. W. Board Ass'y will not be supplied, but those which are filled with the Parts No. in the Parts No. columns will be supplied .
- As a rule, the resistors and capacitors which are indicated as shown in "HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS" are not shown in the list of the parts on the board .

When ordering the service parts, confirm the resistance/rated power, capacitance/rated voltage, and type of the parts, then order by the part No. indicated according to "HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS" .

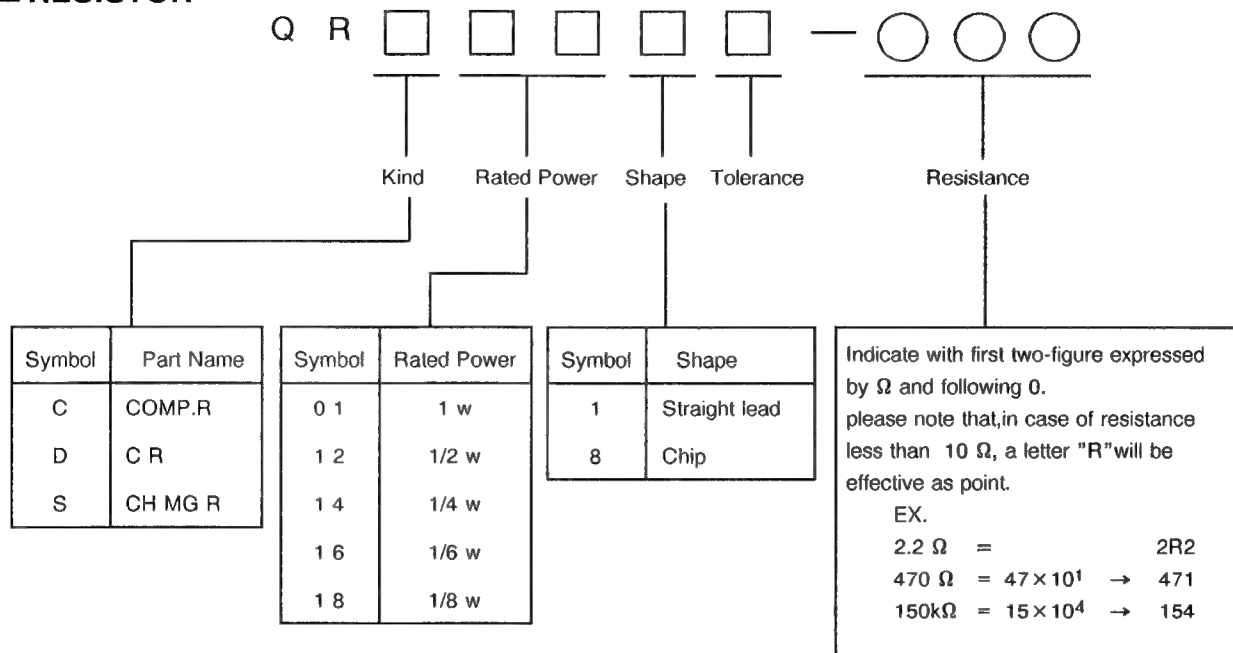
ABBREVIATIONS OF RESISTORS, CAPACITORS AND TOLERANCES

RESISTORS		CAPACITORS	
C R	Carbon Resistor	C CAP.	Ceramic Capacitor
F R	Fusible Resistor	E CAP.	Electrolytic Capacitor
P R	Plate Resistor	M CAP.	Mylar Capacitor
V R	Variable Resistor	HV CAP.	High Voltage Capacitor
HV R	High Voltage Resistor	MF CAP.	Metalized Film Capacitor
MF R	Metal Film Resistor	MM CAP.	Metalized Mylar Capacitor
MG R	Metal Glazed Resistor	MP CAP.	Metalized Polystyrol Capacitor
MP R	Metal Plate Resistor	PP CAP.	Polypropylene Capacitor
OM R	Metal Oxide Film Resistor	PS CAP.	Polystyrol Capacitor
CMF R	Coating Metal Film Resistor	TF CAP.	Thin Film Capacitor
UNF R	Non-Flammable Resistor	MPP CAP.	Metalized Polypropylene Capacitor
CH V R	Chip Variable Resistor	TAN. CAP.	Tantalum Capacitor
CH MG R	Chip Metal Glazed Resistor	CH C CAP.	Chip Ceramic Capacitor
COMP. R	Composition Resistor	BP E CAP.	Bi-Polar Electrolytic Capacitor
LPTC R	Linear Positive Temperature Coefficient Resistor	CH AL E CAP.	Chip Aluminum Electrolytic Capacitor
		CH AL BP CAP.	Chip Aluminum Bi-Polar Capacitor
		CH TAN. E CAP.	Chip Tantalum Electrolytic Capacitor
		CH AL BP E CAP.	Chip Tantalum Bi-Polar Electrolytic Capacitor

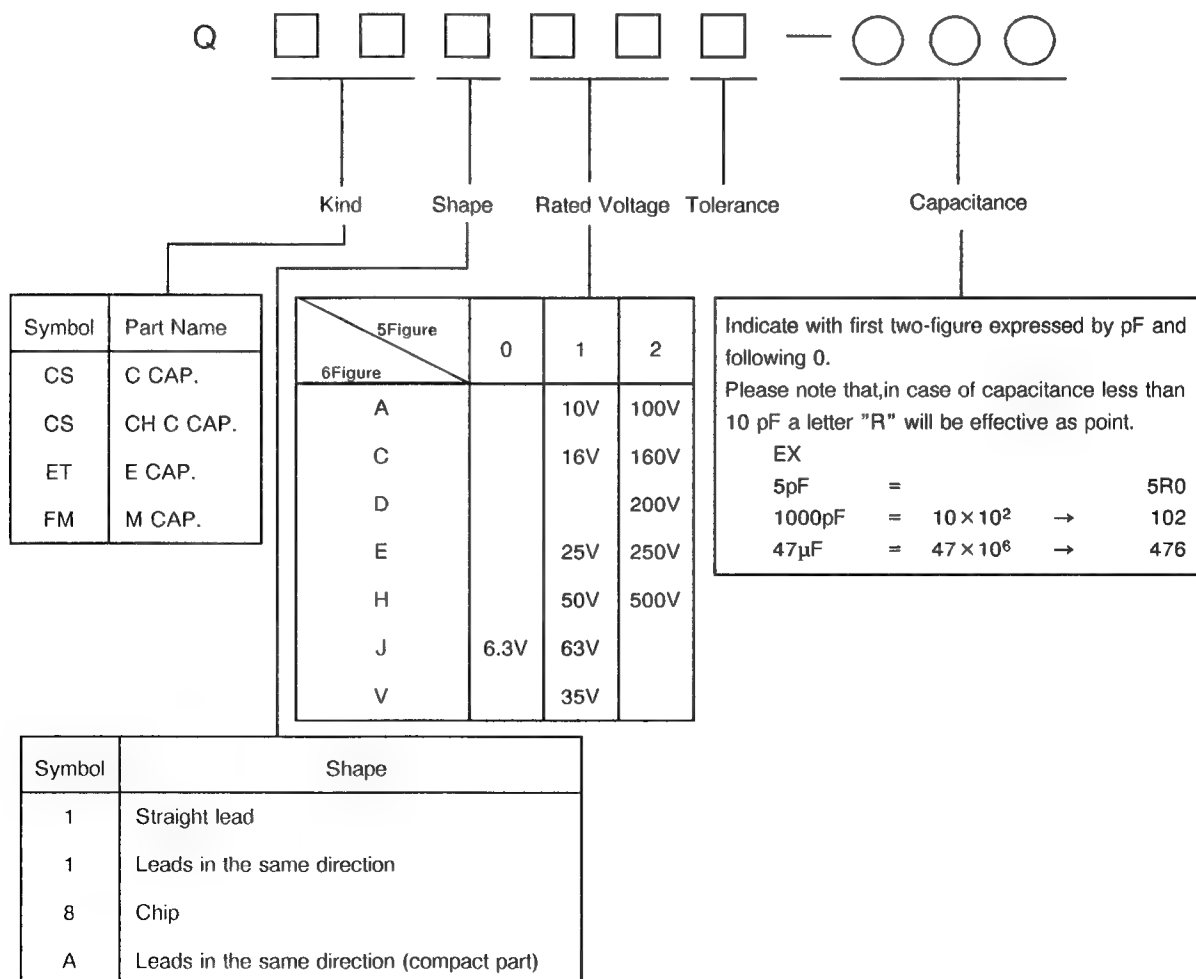
TOLERANCES									
F	G	J	K	M	N	R	H	Z	P
$\pm 1\%$	$\pm 2\%$	$\pm 5\%$	$\pm 10\%$	$\pm 20\%$	$\pm 30\%$	+ 30% - 10%	+ 50% - 10%	+ 80% - 20%	+ 100% - 0%

HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS

■ RESISTOR



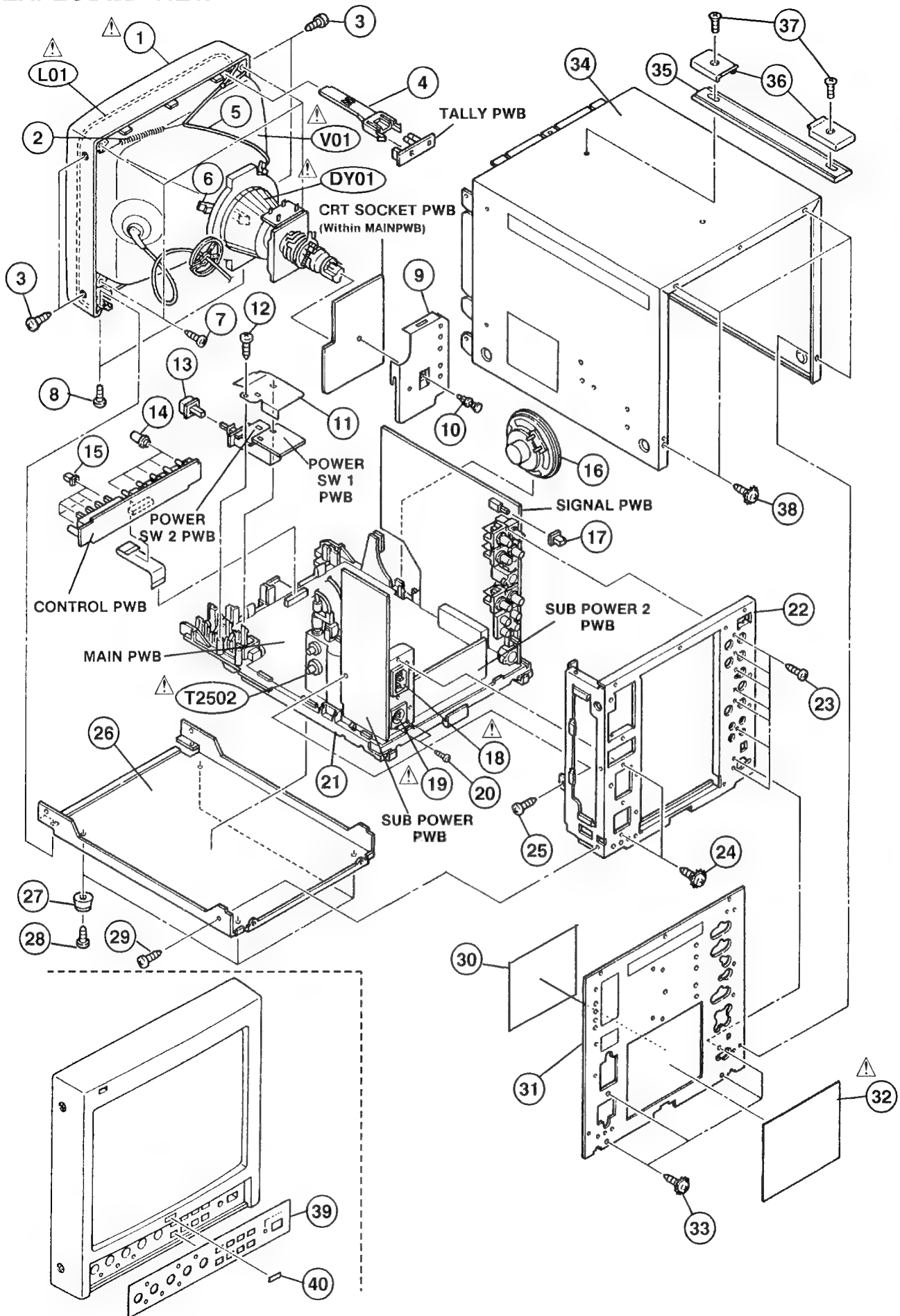
■ CAPACITOR



EXPLODED VIEW PARTS LIST

△ Ref.No.	Part No.	Part Name	Description	Local
△ L01	CELD046-001J1	DEGAUSSING COIL		
△ V01	A22JWG098X	PICTURE TUBE(C)		
△ DY01	CE20300-00A	DEFLECTION YOKE		
△ T2502	CJ28347-00B	HV TRANSF.		
△ 1	CM12867-B01-V0	FRONT PANEL		
2	CM48174-001	SPRING		
3	SDSF3006M	SCREW	(×4)	
4	CM36546-A01	TALLY LENS		
5	CHGB0016-0G-N	BRAIDED WIRE		
6	CE40666-00A	WEDGE	(×3)	
7	GBSF4016M	TAPPING SCREW	(×4)	
8	GBSG3008Z	TAPPING SCREW	(×2)	
9	CM36519-001	GUARD SHEET		
10	CM45627-00A	RIVET		
11	CM48246-001	PW SW SHEET		
12	SBSF4012Z	TAPPING SCREW		
13	CM46115-C01	POWER KNOB		
14	CM47853-002	VOLUME KNOB	(×5)	
15	CM46044-001	PUSH KNOB	(×8)	
16	CEBS08P-01KJ2	SPEAKER	SP01	
17	CM46044-001	PUSH KNOB		
△ 18	QMCB006-C01	AC INLET	J9901(With in SUB POWER PWB)	
△ 19	CEMR007-A0B	CANNON PLUG ASSY	(DC INLET)	
20	SPST2606N	TH.TAP.SCREW	(×2)	
21	CM12868-A01-V0	CHASSIS BASE		
22	CM12869-001	TERMINAL BKT		
23	SBSB3010M	TAPPING SCREW	(×7)	
24	CM44287-00C	ASSY SCREW	(×2)	
25	SBSF4012Z	TAPPING SCREW		
26	CM22942-C01	BOTTOM COVER		
27	QZF2207-001	FOOT	(×4)	
28	GBSG3008Z	TAPPING SCREW	(×4)	
29	CM44287-00C	ASSY SCREW		
30	CM36241-005	WARNING LABEL		
31	CM23130-A0A	REAR PANEL		
△ 32	CM22900-006(R)	ROLL R LABEL		
33	CM44287-00C	ASSY SCREW	(×4)	
34	CM12879-00A	TOP COVER ASSY		
35	PU46361-2	HANDLE		
36	PRD43812	HANDLE COVER	(×2)	
37	SHSP4014R	SCREW	(×2)	
38	CM44287-00C	ASSY SCREW	(×4)	
39	CM23089-A01	CONTROL SHEET		
40	CM48149-A01	JVC MARK		

EXPLODED VIEW



PRINTED WIRING BOARD PARTS LIST

SIGNAL PW BOARD ASS'Y (FX-1090A)

△ Symbol No.	Part No.	Part Name	Description	Local
VARIABLE RESISTOR				
R1206	QVPC611-102HZ	V R(COMB A.D.J)	1k Ω B	
R1344	QVPC611-202HZ	V R(DL AMP)	2k Ω B	
RESISTOR				
R1616	QRD12CJ-271SX	C R	270 Ω 1/2W J	
△ R1620	QRD14CJ-470SX	C R	47 Ω 1/4W J	
CAPACITOR				
C1003	QFV71HJ-104MZ	TF CAP.	0.1 μ F 50V J	
C1005	QFV71HJ-104MZ	TF CAP.	0.1 μ F 50V J	
C1007	QFV71HJ-104MZ	TF CAP.	0.1 μ F 50V J	
C1009	QFV71HJ-104MZ	TF CAP.	0.1 μ F 50V J	
C1011	QFV71HJ-104MZ	TF CAP.	0.1 μ F 50V J	
C1013	QFV71HJ-104MZ	TF CAP.	0.1 μ F 50V J	
C1015	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1201	NCT03CH-680AY	CHIP CAP.	68 p F 50V J	
C1203	QEN61HM-105Z	BP E CAP.	1 μ F 50V M	
C1205	QEN61CM-476Z	BP E CAP.	47 μ F 16V M	
C1206	NCT03CH-560AY	CHIP CAP.	56 p F 50V J	
C1210	QEN61CM-476Z	BP E CAP.	47 μ F 16V M	
C1212	NCT03CH-470AY	CHIP CAP.	47 p F 50V J	
C1214	NCT03CH-102AY	CHIP CAP.	1000 p F 50V J	
C1216-17	QEN61CM-476Z	BP E CAP.	47 μ F 16V M	
C1225	NCT03CH-390AY	CHIP CAP.	39 p F 50V J	
C1226	QAT3110-450A	TRIM.CAP.	45 p F 100V	
C1231	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1233	NCT03CH-5R0AY	CHIP CAP.	5 p F 50V J	
C1234	QFV71HJ-684MZ	TF CAP.	0.68 μ F 50V J	
C1301	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1302	NCT03CH-221AY	CHIP CAP.	220 p F 50V J	
C1303	QFV71HJ-104MZ	TF CAP.	0.1 μ F 50V J	
C1305-09	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1311	NCT03CH-101AY	CHIP CAP.	100 p F 50V J	
C1312-14	QAT3110-450A	TRIM.CAP.	45 p F 100V	
C1315	NCT03CH-101AY	CHIP CAP.	100 p F 50V J	
C1316	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1317	NCT03CH-221AY	CHIP CAP.	220 p F 50V J	
C1318	NCB21HK-223AY	CHIP CAP.	0.022 μ F 50V K	
C1319	NCT03CH-101AY	CHIP CAP.	100 p F 50V J	
C1321-23	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1324	QEN61CM-106Z	BP E CAP.	10 μ F 16V M	
C1325	NCB21HK-153AY	CHIP CAP.	0.015 μ F 50V K	
C1327	QAT3110-450A	TRIM.CAP.	45 p F 100V	
C1328	NCT03CH-220AY	CHIP CAP.	22 p F 50V J	
C1329	QAT3110-450A	TRIM.CAP.	45 p F 100V	
C1330	NCT03CH-220AY	CHIP CAP.	22 p F 50V J	
C1331	NCT03CH-470AY	CHIP CAP.	47 p F 50V J	
C1332	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1335	NCT03CH-561AY	CHIP CAP.	560 p F 50V J	
C1337	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1338	NCT03CH-220AY	CHIP CAP.	22 p F 50V J	
C1339	NCB21HK-103AY	CHIP CAP.	0.01 μ F 50V K	
C1340-43	NCT03CH-390AY	CHIP CAP.	39 p F 50V J	
C1344	NCT03CH-151AY	CHIP CAP.	150 p F 50V J	
C1603-04	NCT03CH-390AY	CHIP CAP.	39 p F 50V J	
C1610	NCT03CH-102AY	CHIP CAP.	1000 p F 50V J	
C1613	QEH1EM-108MZ	E CAP.	1000 μ F 25V M	
C1617	NCB21HK-473AY	CHIP CAP.	0.047 μ F 50V K	
C1803	NCB21HK-102AY	CHIP CAP.	1000 p F 50V K	
C1805	NCT03CH-181AY	CHIP CAP.	180 p F 50V J	
C1807	QFV71HJ-334MZ	TF CAP.	0.33 μ F 50V J	

△ Symbol No.	Part No.	Part Name	Description	Local
C A P A C I T O R				
C1809	NCB21HK-472AY	CHIP CAP.	4700 p F 50V	K
C1810	NCB21HK-102AY	CHIP CAP.	1000 p F 50V	K
C1811	NCT03CH-221AY	CHIP CAP.	220 p F 50V	J
C1812	NCT03CH-102AY	CHIP CAP.	1000 p F 50V	J
C1813	NCB21HK-153AY	CHIP CAP.	0.015 μ F 50V	K
C1814	NCB21HK-222AY	CHIP CAP.	2200 p F 50V	K
C1815	NCT03CH-101AY	CHIP CAP.	100 p F 50V	J
C1816	NCT03CH-470AY	CHIP CAP.	47 p F 50V	J
C1817	NCT03CH-390AY	CHIP CAP.	39 p F 50V	J
C1818	NCT03CH-101AY	CHIP CAP.	100 p F 50V	J
C1819	QEN61CM-476Z	BP E CAP.	47 μ F 16V	M
C1820	NCT03CH-560AY	CHIP CAP.	56 p F 50V	J
C1821	NCT03CH-101AY	CHIP CAP.	100 p F 50V	J
C1822	NCB21HK-562AY	CHIP CAP.	5600 p F 50V	K
T R A N S F O R M E R				
T1301	CELT034-001	B.PASS TRANSF.		
T1302	CELT034-002	B.PASS TRANSF.		
T1303	CE40176-001	DL P.TRANSF.		
C O I L				
L1201	CELP026-270Z	PEAKING COIL	27 μ H	
L1202	CELP026-101Z	PEAKING COIL	100 μ H	
L1203	CELP026-220Z	PEAKING COIL	22 μ H	
L1204	CELP026-180Z	PEAKING COIL	18 μ H	
L1301	CELP026-180Z	PEAKING COIL	18 μ H	
L1302-03	CELP026-8R2Z	PEAKING COIL	8.2 μ H	
L1304	CELP026-390Z	PEAKING COIL	39 μ H	
L1305	CELP026-4R7Z	PEAKING COIL	4.7 μ H	
L1306-07	CELP026-221Z	PEAKING COIL	220 μ H	
L1308	CELP026-560Z	PEAKING COIL	56 μ H	
L1601	CELP026-4R7Z	PEAKING COIL	4.7 μ H	
D I O D E				
D1001-19	1SS353-X	SI.DIODE		
D1022-28	1SS353-X	SI.DIODE		
D1031	1SS133-T2	SI.DIODE		
D1101-04	1SS353-X	SI.DIODE		
D1201-02	1SS353-X	SI.DIODE		
D1204-05	1SS353-X	SI.DIODE		
D1208	MA3056(H)-X	ZENER DIODE		
D1301-08	1SS353-X	SI.DIODE		
D1310	MA3091(M)-X	ZENER DIODE		
D1601	MA3150(M)-X	ZENER DIODE		
D1801-03	1SS353-X	SI.DIODE		
T R A N S I S T O R				
Q1001	2SA1037K(QR)-X	SI.TRANSISTOR		
Q1005	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1006-07	DTC144EKA-X	DIGI.TRANSISTOR		
Q1008	2SA1037K(QR)-X	SI.TRANSISTOR		
Q1009	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1010	2SA1037K(QR)-X	SI.TRANSISTOR		
Q1011-12	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1013	2SA1037K(QR)-X	SI.TRANSISTOR		
Q1014-16	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1017	2SA1037K(QR)-X	SI.TRANSISTOR		
Q1018-20	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1021	2SA1037K(QR)-X	SI.TRANSISTOR		
Q1022-23	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1024-25	DTC144EKA-X	DIGI.TRANSISTOR		
Q1101-04	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1201-04	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1205	DTC144EKA-X	DIGI.TRANSISTOR		
Q1206	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1207	DTC144EKA-X	DIGI.TRANSISTOR		
Q1208	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1209	2SA1037K(QR)-X	SI.TRANSISTOR		

△ Symbol No.	Part No.	Part Name	Description	Local
T R A N S I S T O R				
Q1210	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1211	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1212-20	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1222-25	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1301-02	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1304-07	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1310-13	DTC144EKA-X	DIGI. TRANSISTOR		
Q1314-15	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1316	DTC144EKA-X	DIGI. TRANSISTOR		
Q1320-21	DTC144EKA-X	DIGI. TRANSISTOR		
Q1601-02	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1603	DTC144EKA-X	DIGI. TRANSISTOR		
Q1801	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1802	DTC144EKA-X	DIGI. TRANSISTOR		
Q1803-04	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1805-06	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1807-10	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1811	DTC144EKA-X	DIGI. TRANSISTOR		
I C				
IC1101	LA7016	I.C. (MONO-ANA)		
IC1201-02	TC4066BF-W	I.C. (DIGI-MOS)		
IC1203	AN5613	I.C. (MONO-ANA)		
IC1301-02	TC4066BF-W	I.C. (DIGI-MOS)		
IC1303	AN5625N	I.C. (MONO-ANA)		
IC1601	TC4066BF-W	I.C. (DIGI-MOS)		
IC1602	AN5265	I.C. (MONO-ANA)		
IC1801	TC4066BF-W	I.C. (DIGI-MOS)		
IC1802	TC4538BF-W	I.C. (DIGI-MOS)		
IC1803	TC4066BF-W	I.C. (DIGI-MOS)		
IC1804-07	TC4538BF-W	I.C. (DIGI-MOS)		
O T H E R S				
DL1201	CE42099-003	DELAY LINE		
DL1301	CE40907-B01	DELAY LINE(1H)		
DL1302	CE41489-001	DELAY LINE(1H)		
J1001	QMCC503-C01	DIN JACK	(TALLY/REMOTE)	
J1101	CEMB021-001	BNC CONNECTOR	(VIDEO A)	
J1102	CEMB021-001	BNC CONNECTOR	(VIDEO B)	
J1201	QMCC004-C01	MINI DIN JACK	(Y/C IN)	
J1202	QMD2B04-001	MINI CONNECTOR	(Y/C OUT)	
J1601	CEMN036-005	PIN JACK	(AUDIO)	
J1801	CEMB021-001	BNC CONNECTOR	(EXT SYNC)	
S1001	QSS1F22-C07	SLIDE SWITCH	(AFC)	
S1201	QSTQ101-C02	PUSH SWITCH	(SET UP)	
S1301	QSL4A13-C03Z	LEVER SWITCH	(APC SW1)	
S1302	QSL4A13-C03Z	LEVER SWITCH	(APC SW2)	
TH001	ERT-D2ZHL503S	THERMISTOR		
X1301	CE40749-001Z	CRYSTAL		
X1302	CE40668-001Z	CRYSTAL		

MAIN, CRT SOCKET PW BOARD ASS'Y (FX-2051A)

△ Symbol No.	Part No.	Part Name	Description	Local
VARIABLE RESISTOR				
R2303	QVPE805-103H	V R(R CUT OFF)	10k Ω B	
R2306	QVPE805-201H	V R(R DRIVE)	200 Ω B	
R2313	QVPE805-103H	V R(G CUT OFF)	10k Ω B	
R2316	QVPE805-201H	V R(G DRIVE)	200 Ω B	
R2323	QVPE805-103H	V R(B CUT OFF)	10k Ω B	
R2415	QVPC611-501HZ	V R(V.LIN)	500 Ω B	
R2417	QVPC611-501HZ	V R(V.SIZE)	500 Ω B	
R2420	QVPC611-102HZ	V R(V.SIZE UNDER)	1k Ω B	
R2427	QVPC611-501HZ	V R(V.CENT)	500 Ω B	
R2510	QVPC611-502HZ	V R(H.HOLD)	5k Ω B	
R2514	QVPC611-103HZ	V R(H.POSI)	10k Ω B	
RESISTOR				
R2304	QRG029J-822A	OM R	8.2k Ω 2W J	
R2314	QRG029J-822A	OM R	8.2k Ω 2W J	
R2324	QRG029J-822A	OM R	8.2k Ω 2W J	
R2421	QRX019J-4R7S	MF R	4.7 Ω 1W J	
△ R2516	QRV141F-2701AY	MF R	2.7k Ω 1/4W F	
△ R2517	QRV141F-6801AY	MF R	6.8k Ω 1/4W F	
△ R2518	QRZ0054-4R7M	F R	4.7 Ω 1/4W J	
△ R2519	QRH017J-150M	F R	15 Ω 1W J	
△ R2521	QRH017J-3R3M	F R	3.3 Ω 1W J	
△ R2529	QRZ0054-2R2M	F R	2.2 Ω 1/4W J	
R2530	QRX019J-5R6S	MF R	5.6 Ω 1W J	
R2531	QRG029J-331	OM R	330 Ω 2W J	
R2532	QRG019J-122S	OM R	1.2k Ω 1W J	
R2533	QRG019J-681S	OM R	680 Ω 1W J	
R2902	QRF074K-3R3	UNF R	3.3 Ω 7W K	
R2903	QRG039J-223A	OM R	22k Ω 3W J	
R2906	QRG029J-473	OM R	47k Ω 2W J	
R2909	QRM059J-R33	MP R	0.33 Ω 9W J	
△ R2911	QRZ0054-4R7M	F R	4.7 Ω 1/4W J	
R2932	QRX019J-1R0S	MF R	1 Ω 1W J	
△ R2961	QRZ0054-180M	F R	18 Ω 1/4W J	
R2968	QRG029J-471A	OM R	470 Ω 2W J	
R2973	QRG029J-681A	OM R	680 Ω 2W J	
△ R2977	QRZ0054-2R2M	F R	2.2 Ω 1/4W J	
△ R2978	QRC122K-685E	COMP.R	6.8M Ω 1/2W K	
CAPACITOR				
C2306	QEHC2EM-105MZ	E CAP.	1 μ F 250V M	
C2307	QCZ0121-102M	C CAP.	1000 p F 3000V P	
C2309	QEHC2EM-475MZ	E CAP.	4.7 μ F 250V M	
C2310	QEHC1CM-107MZ	E CAP.	100 μ F 16V M	
C2402	QFLC1HJ-103MZ	M CAP.	0.01 μ F 50V J	
C2404	QFLC1HJ-682MZ	M CAP.	6800 p F 50V J	
C2407	QEE61VK-105BZ	TAN.CAP.	1 μ F 35V K	
C2408	QFLC1HJ-223MZ	M CAP.	0.022 μ F 50V J	
C2409-10	QFLC1HJ-103MZ	M CAP.	0.01 μ F 50V J	
C2414	QFLC1HJ-223MZ	M CAP.	0.022 μ F 50V J	
C2502	QFLC1HJ-563MZ	M CAP.	0.056 μ F 50V J	
C2503	QFLC1HJ-682MZ	M CAP.	6800 p F 50V J	
C2505	QFP31HJ-332SZ	PP CAP.	3300 p F 50V J	
C2506	QFLC1HJ-222MZ	M CAP.	2200 p F 50V J	
C2508	QFV71HJ-474MZ	TF CAP.	0.47 μ F 50V J	
C2510	QFLC1HJ-123MZ	M CAP.	0.012 μ F 50V J	
C2512	QFLC1HJ-393MZ	M CAP.	0.039 μ F 50V J	
C2513	QFLC1HJ-152MZ	M CAP.	1500 p F 50V J	
C2515	QETC1VM-107Z	E CAP.	100 μ F 35V M	
C2519	QETC1VM-108Z	E CAP.	1000 μ F 35V M	
C2520	QFV71HJ-124MZ	TF CAP.	0.12 μ F 50V J	
C2525	QFLC1HJ-473MZ	M CAP.	0.047 μ F 50V J	
C2527	QFLC2AK-472MZ	M CAP.	4700 p F 100V K	
C2528	QFLC2AK-822MZ	M CAP.	8200 p F 100V K	

△ Symbol No.	Part No.	Part Name	Description	Local
CAPACITOR				
△ C2530	QFZ0117-3801S	MPP CAP.	3800 p F 1.4kVH ± 2.5%	
C2532	QFLC2AK-563MZ	M CAP.	0.056 μ F 100V	K
C2533	QETC2EM-106Z	E CAP.	10 μ F 250V	M
C2534	QFZ0119-224S	MPP CAP.	0.22 μ F 200V	± 3%
△ C2907	QCZ9034-472A	C CAP.	4700 p FAC400V	P
△ C2908	QCZ9034-472A	C CAP.	4700 p FAC400V	P
△ C2909	QCZ9034-472A	C CAP.	4700 p FAC400V	P
△ C2910	QCZ9034-472A	C CAP.	4700 p FAC400V	P
C2911	QEZ0199-227R	E CAP.	220 μ F 200V	P
C2912	QCF22HP-103M	CH C CAP.	0.01 μ F 500V	P
C2913	QCZ0122-271U	C CAP.	270 p F 2000V	K
C2916	QCZ0122-151U	C CAP.	150 p F 2000V	K
C2934	QCZ0122-561A	C CAP.	560 p F 2000V	K
C2936	QEZ0203-107	E CAP.	100 μ F 160V	
C2938	QFM72DK-473M	M CAP.	0.047 μ F 200V	K
C2940	QEZ0203-107	E CAP.	100 μ F 160V	
C2959	QFV71HJ-224MZ	TF CAP.	0.22 μ F 50V	J
C2965	QEM51EM-337M	E CAP.	330 μ F 25V	M
C2968	QFLC1HJ-472MZ	M CAP.	4700 p F 50V	J
TRANSFORMER				
△ T2501	CE41106-00C	DRIVE TRANSF.		
△ T2502	CJ28347-00B	HV TRANSF.		
△ T2901	CETS034-001J2	SWITCH TRANSF.		
T2951	A76567-MA	P.DRIVE TRANSF.		
T2952	CETS072-001	SW REACTOR		
COIL				
L2301-03	CELP026-271Z	PEAKING COIL	270 μ H	
△ L2501	CE40140-00F	WIDTH COIL		
△ L2502	CELL016-001	LINEARITY COIL		
L2931	CELC058-820Z	CHOKE COIL		
DIODE				
D2305	RGP10J(C1)-T3	SI.DIODE		
D2401	1SS133-T2	SI.DIODE		
D2402	MA4051(M)-T2	ZENER DIODE		
D2403	1SR35-100A-T2	SI.DIODE		
D2404	1SS133-T2	SI.DIODE		
△ D2501	MA4068(N)C1-T2	ZENER DIODE		
D2502	1SS81-T2	SI.DIODE		
D2503-04	RGP10J(C1)-T3	SI.DIODE		
D2505	RU30-C1	SI.DIODE		
D2506	RK14-T3	SI.DIODE		
D2507	RD11ES(B3)-T2	SI.DIODE		
D2508	RGP10J(C1)-T3	SI.DIODE		
D2509	ERD07-15-L	SI.DIODE		
D2510	RU2-T3	SI.DIODE		
D2511	RH1S-T3	SI.DIODE		
D2512	1SS133-T2	SI.DIODE		
D2513	1SR124-400A-T2	SI.DIODE		
△ D2901	S1VBA60	BRIDGE DIODE		
D2902	RU1C-LFC4	SI.DIODE		
D2905	AU01Z-T2	SI.DIODE		
D2931	RGP10J(C1)-T3	SI.DIODE		
D2932	RU3AM-LFC4	SI.DIODE		
D2933	MA4180(M)-T2	ZENER DIODE		
D2935	MA4051(M)-T2	ZENER DIODE		
D2936	1SS133-T2	SI.DIODE		
D2951	1SR35-100A-T2	SI.DIODE		
D2952	1SS146-T2	SI.DIODE		
D2958	1SR35-100A-T2	SI.DIODE		
D2962	RGP10J(C1)-T3	SI.DIODE		
D2963	RD39E(B3)-T5	SI.DIODE		
D2964	FML-G14S	SI.DIODE		
D2965	1SS133-T2	SI.DIODE		
TRANSISTOR				
Q2301-03	2SC2611	SI.TRANSISTOR		

△ Symbol No.	Part No.	Part Name	Description	Local
T R A N S I S T O R				
Q2401	2SC3311A(QR)-T	SI. TRANSISTOR		
Q2402	2SD1853-T	SI. TRANSISTOR		
Q2403	DTC124ES-T	DIGI. TRANSISTOR		
Q2501	2SC3311A(QR)-T	SI. TRANSISTOR		
Q2502	DTC124ES-T	DIGI. TRANSISTOR		
Q2503	2SC2655(Y)-T	SI. TRANSISTOR		
△ Q2504	2SD1878-YD	SI. TRANSISTOR	H.OUT	
Q2505	IRF620	F.E.T.		
Q2506	2SC2482(C1)-T	SI. TRANSISTOR		
△ Q2901	IRF1BC40G	F.E.T.		
Q2931	2SA949(Y)C1	SI. TRANSISTOR		
Q2932	DTC124ESA-T	DIGI. TRANSISTOR		
Q2933	DTC124ES-T	DIGI. TRANSISTOR		
Q2934	2SC3311A(QR)-T	SI. TRANSISTOR		
Q2935	2SA1309A(QR)-T	SI. TRANSISTOR		
Q2953	2SC1627A(Y)-T	SI. TRANSISTOR		
Q2954	2SC2750(L)	SI. TRANSISTOR		
I C				
IC2401	LA7830	I.C. (MONO-ANA)		
IC2402	TC4052BP	I.C. (DIGI-MOS)		
IC2501	HA11423	I.C. (MONO-ANA)		
IC2502	AN7812F	I.C. (MONO-ANA)		
IC2931	S1854-C1	I.C. (MONO-ANA)		
IC2952	TA78012AP	I.C. (MONO-ANA)		
O T H E R S				
△ CP2931	ICP-N38-Y	I.C. PROTECT		
△ F2951	QMF51U1-4R0S	FUSE	4.0A	
K2401-02	CE41433-001Z	BEADS CORE		
K2901	CE42050-001Z	CORE		
K2903	CE42050-001Z	CORE		
K2904	CE41433-001Z	BEADS CORE		
K2931	CE42050-001Z	CORE		
K2933	CE42050-001Z	CORE		
△ PC2901	CNY17F-C1	I.C. (PH. COUPLER)		
△ RY2951	CESK028-001	RELAY		
S2501	QSL4A13-C03Z	LEVER SWITCH	(H. SYNC SW)	
S2502	QSL4A13-C03Z	LEVER SWITCH	(H. CENT SW)	
△ SK2001	CE42554-001	C.R.T. SOCKET		
△ TH2901	CEKP003-001	P. THERMISTOR		

CONTROL PW BOARD ASS'Y (FX-4044A)

△ Symbol No.	Part No.	Part Name	Description	Local
V A R I A B L E R E S I S T O R				
R4002	QVGA004-CB14A	V R(VOLUME)	10k Ω B	
R4006	QVPC611-103HZ	V R(SUB PHASE)	10k Ω B	
R4007	QVGA003-CB14A	V R(PHASE)	10k Ω B	
R4010	QVGA003-CB14A	V R(CHAROMA)	10k Ω B	
R4012	QVPC611-103HZ	V R(SUB CHROMA PAL)	10k Ω B	
R4015	QVPC611-103HZ	V R(SUB CHROMA NTSC)	10k Ω B	
R4020	QVGA003-CB14A	V R(BRIGHT)	10k Ω B	
R4022	QVPC611-103HZ	V R(SUB BRIGHT)	10k Ω B	
R4025	QVGA003-CB14A	V R(CONTRAST)	10k Ω B	
R4026	QVPC611-103HZ	V R(SUB CONT)	10k Ω B	
R4029	QVPC611-502HZ	V R(V.HOLD)	5k Ω B	
C A P A C I T O R				
C4001	QER51CM-226M	E CAP.	22 μ F 16V M	
C4002	QFV71HJ-104MZ	TF CAP.	0.1 μ F 50V J	
D I O D E				
D4001	SML1216W	L.E.D.	(POWER LED)	
T R A N S I S T O R				
Q4001-03	DTC144EKA-X	DIGI. TRANSISTOR		
O T H E R S				
S4001	CM46942-A01	LED HOLDER		
S4001	QSW0379-001	PUSH SWITCH(UNDER SCAN,PULSE CROSS,COLOR OFF,BULE CHECK)		
S4002	QSW0379-001	PUSH SWITCH(INPUT A/B,EXT SYNC,NTSC/PAL,4:3/16:9)		

TALLY PW BOARD ASS'Y (FX-4045A)

△ Symbol No.	Part No.	Part Name	Description	Local
D I O D E				
D4002-03	SLR-56DC3F	L.E.D.(ORG)	(TALLY LAMP)	
O T H E R S				
	CM48038-001	L.E.D.HOLDER		

SUB POWER PW BOARD ASS'Y (FX-9049A)

△ Symbol No.	Part No.	Part Name	Description	Local
C A P A C I T O R				
△ C9901	QFZ9036-473M	MF CAP.	0.047 μ FAC250V M	
△ C9902	QFZ9036-473M	MF CAP.	0.047 μ FAC250V M	
△ C9904	QCZ9033-472A	C CAP.	4700 p FAC400V M	
△ C9905	QCZ9033-472A	C CAP.	4700 p FAC400V M	
△ C9906	QCZ9033-472A	C CAP.	4700 p FAC400V M	
O T H E R S				
△ F9901	QMF51U1-4R0S	FUSE	4.0A	
△ J9901	QMCB006-C01	AC INLET		
△ LF9901	CELF001-002J1	LINE FILTER		
△ VA9901	ERZV10V621CS	VARISTOR		

SUB POWER 2 PW BOARD ASS'Y (FX-9054A)

△ Symbol No.	Part No.	Part Name	Description	Local
V A R I A B L E R E S I S T O R				
R9958	QVPC611-203HZ	V R(BATT PROT)	20k Ω B	
R9974	QVPC611-202HZ	V R(B1 ADJ)	2k Ω B	
R E S I S T O R				
△ R9972	QRV141F-6801AY	MF R	6.8k Ω 1/4W	F
△ R9975	QRV141F-1503AY	MF R	150k Ω 1/4W	F
C A P A C I T O R				
C9917	QFLC1HJ-562MZ	M CAP.	5600 p F 50V	J
C9920	QFLC1HJ-272MZ	M CAP.	2700 p F 50V	J
C9921	QFLC1HJ-332MZ	M CAP.	3300 p F 50V	J
C9926	QFLC1HJ-122MZ	M CAP.	1200 p F 50V	J
C9953	QETC1VM-106Z	E CAP.	10 μ F 35V	M
C9956	QFV71HJ-474MZ	TF CAP.	0.47 μ F 50V	J
C9957	QFLC1HJ-123MZ	M CAP.	0.012 μ F 50V	J
C9963	QFV71HJ-105MZ	TF CAP.	1 μ F 50V	J
C9969	QFLC1HJ-562MZ	M CAP.	5600 p F 50V	J
D I O D E				
D9903	1SS81-T2	SI.DIODE		
D9904	MA4150(M)-T2	ZENER DIODE		
D9907	MA4150(M)-T2	ZENER DIODE		
D9953-56	1SS133-T2	SI.DIODE		
D9957	MA4051(M)-T2	ZENER DIODE		
D9959-60	1SS133-T2	SI.DIODE		
D9961	MA4051(M)-T2	ZENER DIODE		
T R A N S I S T O R				
Q9902	2SC3311A(QR)-T	SI.TRANSISTOR		
Q9951-52	2SC3311A(QR)-T	SI.TRANSISTOR		
I C				
IC9901	AN8026	I.C.(MONO-ANA)		
IC9951	AN5900	I.C.(MONO-ANA)		
IC9953	UPC4558C	I.C.(MONO-ANA)		

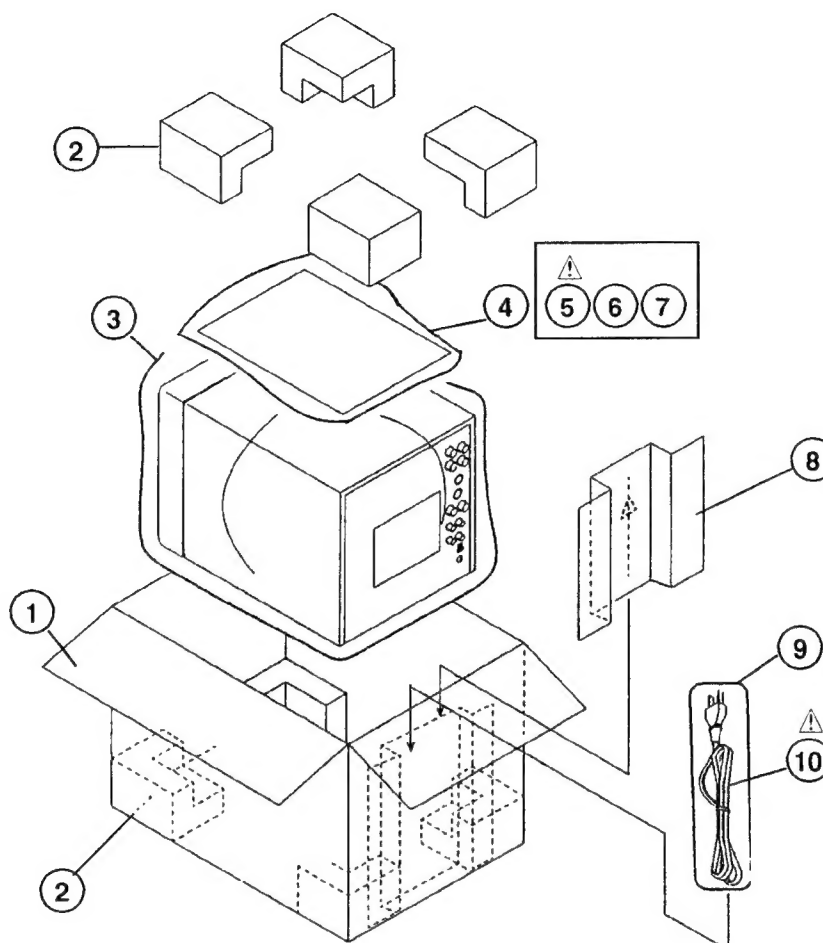
POWER SW 1 PW BOARD ASS'Y (FX-9051A)

△ Symbol No.	Part No.	Part Name	Description	Local
O T H E R S				
△ S9901	QSW0380-001	PUSH SWITCH	(POWER SW)	

POWER SW 2 PW BOARD ASS'Y (FX-9052A)

This PWB ASS'Y has no part to be supplied.

PACKING



PACKING PARTS LIST

△ Ref.No.	Part No.	Part Name	Description	Local
1	CP11224-A41	PACKING CASE		
2	CP11460-B0A	CUSHION ASSY	8pcs in 1set	
3	CP30974-003	POLY BAG		
4	CP30975-001	POLY BAG		
△ 5	CQ40283-A01	INST.BOOK		
6	BT-51010-1	WARRANTY CARD		
7	BT-20104A	SERVICE INF CARD		
8	CP40339-001	PW CORD HOLDER		
9	QPGA012-03005	POLY BAG		
△ 10	QMP1110-244K	POWER CORD		

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